TX 174
.I6 A4
Copy 1

partment of Public Instruction

EDUCATIONAL PUBLICATIONS

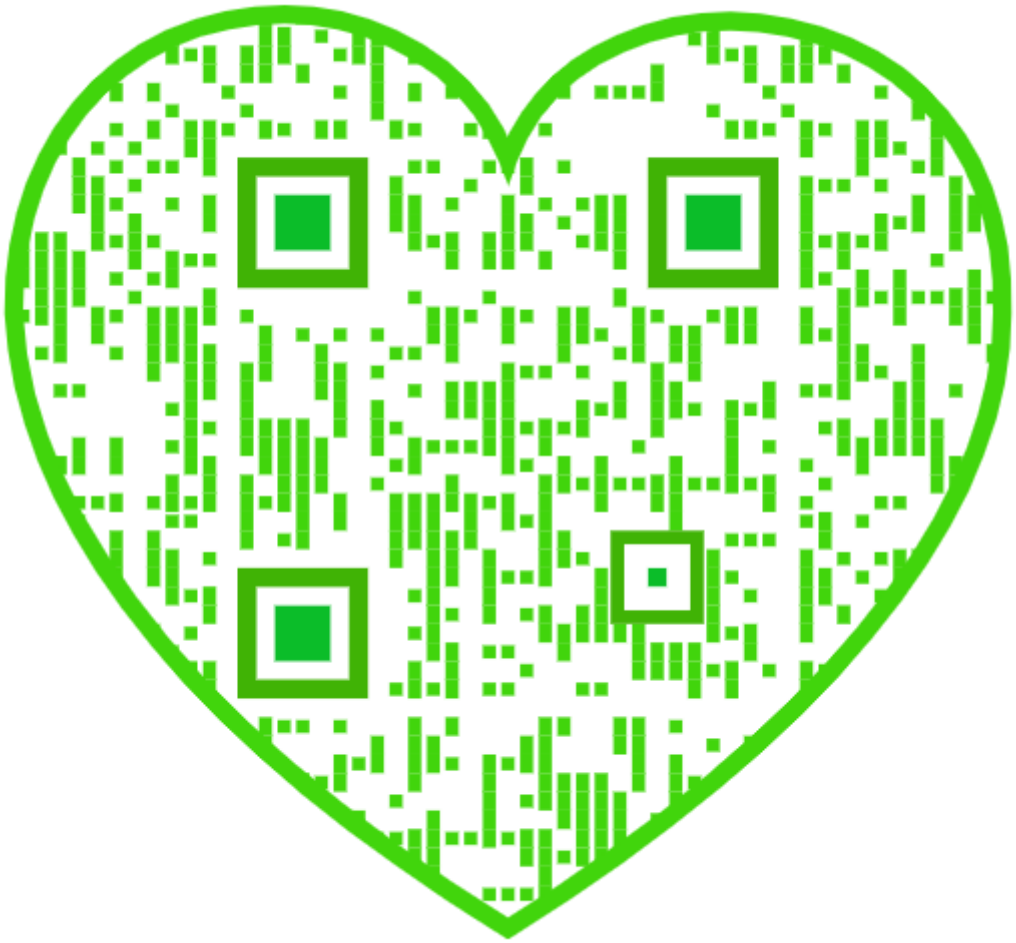
Bulletin No. 20 Vocational Series No. 13

Domestic Science

STATE COURSE OF STUDY FOR THE PUBLIC SCHOOLS OF INDIANA

INDIANAPOLIS, INDIANA
September, 1915

Monograph



Department of Public Instruction

EDUCATIONAL PUBLICATIONS

Bulletin No. 20 Vocational Series No. 13

Domestic Science

STATE COURSE OF STUDY FOR THE PUBLIC SCHOOLS OF INDIANA

INDIANAPOLIS, INDIANA
September, 1915

INDIANAPOLIS:
WM. B. BURFORD, CONTRACTOR FOR STATE PRINTING AND BINDING
1915

DEPARTMENT OF PUBLIC INSTRUCTION

VOCATIONAL DIVISION

CHARLES A. GREATHOUSE

Superintendent of Public Instruction

WILLIAM FREDERICK BOOK

Deputy Superintendent in Charge Vocational Education

Z. M. SMITH

Supervisor Agricultural Education

CONTENTS

PAGE

A. INTRODUCTION 7

1. Minimum requirements for practical arts work 7
   a. Requirements for grades in rural, town and city schools 7
   b. Requirements for commissioned and certified high schools . 7
   c. Qualifications of teachers 8
2. Aim and scope of the practical arts work 8
3. Work in domestic science 10
   a. Aim of domestic science instruction to be given in the regular school course 10
   b. Scope of the domestic science work 11
   c. Methods of instruction 12
   d. Necessary teachers, rooms and equipment for domestic science work in public schools 13
      (1) Requirements for rural schools 13
         (a) Teachers 13
         (b) Rooms and equipment 13
         (c) Library equipment 14
      (2) Requirements for work in seventh and eighth grades in town, township and city schools 14
         (a) Teachers 14
         (b) Rooms and equipment 14
         (c) Library helps 14
         (d) Character of work 14
      (3) Requirements for domestic science work in commissioned and certified high schools 15
         (a) Teachers 15
         (b) Rooms and equipment 15
         (c) Library helps 16
         (d) Character of the work 16

B. Course of study in domestic science for the seventh and eighth grades. 17

1. Work in the rural schools 17
2. Work in town, city and township schools 17
3. Only one line of work should be attempted 17
4. Suggestions for teachers 18
   a. Ends to be attained by domestic science instruction 18
   b. Methods to be employed in domestic science work 19
   c. Needs of local communities must be considered 20
   d. How to meet criticisms 20

PAGE

5. Lessons in cooking and the study of foods outlined by months and weeks 21

6. Lessons in sewing and the study of textiles 58
   a. Equipment needed in the rural school 58
   b. Equipment needed in the city school 58
   c. Lessons in sewing outlined by months and weeks 58

7. Outline for a study of the planning, care, furnishing and management of the home 82

   a. Outline for a study of house 82
      (1) Choosing a site for a home 82
      (2) Cellars 84
      (3) Construction of the framework 85
      (4) Floors and woodwork 86
      (5) House planning 86
      (6) Lighting 88
      (7) Heating 89
      (8) Water supply 91
      (9) Air for the house 92
      (10) Removal of wastes 93
      (11) Furnishing a house 94
         a. Furniture 94
         b. Bedroom 95
         c. Rugs 96
         d. Curtains 97
         e. Kitchen utensils 97
      (12) Cleaning the house 98
      (13) Household pests and their prevention 100
      (14) The cleaning of clothes 101
      (15) Household accounts 102

   b. Special helps for a study of the planning, building, care and furnishing of a house 103

C. Course of study in domestic science for the high school 104
   1. Aim and scope of the work 104
   2. Amount of work to be done 105
   3. Library and laboratory equipment needed 105
   4. Outline for a course in cooking and the study of foods 105
      a. Recitation work 105
      b. Laboratory exercises 106
   5. Outline for a course in sewing and the study of textiles 106
      a. Recitation work 106
      b. Laboratory exercises 106

PAGE

6. Suggestions for course in laundry science 107
   a. Recitation work 107
   b. Laboratory 107
7. Outline for a study of the care of the home, home sanitation and hygiene 107
8. Outline for a course in the planning and furnishing of the home ... 108

D. Library and laboratory equipment needed for domestic science work . 108
1. Library helps needed for domestic science work in rural schools .. 108
   a. Cooking 109
   b. Sewing 110
   c. Laundry 110
   d. Sanitation and hygiene 111
   e. Care, management and beautification of the home 111
2. Laboratory equipment required for domestic science work in rural schools 111
   a. For study of sanitation, hygiene and care of the home 111
   b. For a study of textiles and practice work in sewing 111
   c. For study of foods and cooking 112
3. Laboratory equipment needed for domestic science work in town and city schools 114
   a. Necessary rooms and equipment for sewing 114
   b. Necessary rooms and equipment for cooking 115
      (1) General equipment 116
      (2) Group equipment 117
      (3) Individual equipment 117
4. Library helps needed for domestic science work in town and city schools 118
   a. For cooking 118
   b. Care, management and beautification of the home 119
   c. Textiles and sewing 119
   d. Laundry 120
   e. Sanitation and hygiene 120
   f. Domestic science bulletins 121
      (1) Farmers' bulletins 121
      (2) Helpful college and university bulletins 122
      (3) Other valuable helps 124

STATE COURSE OF STUDY IN DOMESTIC SCIENCE[1]

A. INTRODUCTION.

1. Minimum Requirements for Instruction in Practical Arts Subjects

The law requires that elementary agriculture, elementary domestic science and elementary industrial arts shall be taught in the grades of all town, township and city schools as a part of their regular course of instruction, and further provides that the study of these subjects be continued in all city, town and township high schools, as the state board of education may direct. Every teacher required to teach any of the practical arts subjects should study carefully, and often, the following suggestions and directions for this pre-vocational work.

The minimum requirements for this practical arts work are fixed by the law and the state board of education and are as follows:

a. REQUIREMENTS FOR GRADES IN RURAL, TOWN AND CITY SCHOOLS

All town schools must teach agriculture and industrial arts to the boys of the seventh and eighth grades, and domestic science to the girls of the same grades. All city schools must teach industrial arts to the boys of the seventh and eighth grades, and domestic science to the girls of these grades. Agriculture must be taught in the rural and district schools to the seventh and eighth grade boys and domestic science to the seventh and eighth grade girls. Industrial arts is not required in the rural schools.

The minimum amount of time to be devoted to each of these practical arts subjects in the grades has not been increased this year and is fixed by the state board of education, as two regular recitation periods per week.

b. REQUIREMENTS FOR THE HIGH SCHOOL

All commissioned and certified high schools must provide at least one full year's work in domestic science for the girls and

[1] The term domestic science is used throughout this bulletin in the sense that it is defined in the Indiana law as any education or training which "fits for occupations connected with the household".

a full year's work either in agriculture or industrial arts for the boys. These practical arts subjects should be placed on the same plane as the work in other high school subjects. These courses should be thrown open to all first year students, and no credit towards graduation will be allowed by the state board of education unless a full year's work has been completed in the subject taken.

c. QUALIFICATIONS OF TEACHERS

All teachers required to teach one or more of the practical arts subjects must hold a valid license in the subject or subjects they teach and present such license or special certificate to their trustee or school board when signing their contracts.

2. AIM AND SCOPE OF THE PRACTICAL ARTS WORK

It has long been argued by students of education and child nature, that children can best be educated through their own activity and experience; that children can find themselves better through the avenues of metal, clay and wood construction than through the avenue of books. It has also been pointed out how nature study, a study of agriculture, drawing, manual training and the household arts helps to overcome the isolation which so often exists between school and life; how all forms of hand and constructive work motivates the other school work; how such work is needed to insure the natural and healthy growth and development of all children, and how, without it, normal habits of healthful activity can not be acquired. But quite aside from these educational considerations, it may be shown that instruction and practice in the practical arts subjects is absolutely essential for laying the right sort of a foundation for all forms of productive and creative work. There is, therefore, a double reason for the emphasis put upon this work.

We, in Indiana, have taken upon ourselves the task of providing vocational education for all our people. We are coming to feel that the real glory and true worth of life is not to the spender, but to the producer; that education should prepare us not merely to understand and appreciate the work and achievements of other men and times, but that it should fit us to become skilled and willing producers in some important and useful field of human endeavor. We have come to feel that it takes a skilled worker or producer to make a good citizen of the state, and that every citizen should be prepared by education and training to do some use-

ful form of work. We are coming to see that until this has been achieved the individual will not be able to make his own life of value to himself, or himself of service and worth to society.

There are at least three steps in the process of preparing our present and future citizens for creative and productive work along every line:

1. A period of general education is necessary, a period when the foundations for all occupations and future work are laid. All occupations or callings in life require a certain amount of general education before efficient preparation for a specific occupation can profitably begin. And it is important to remember that the amount of such general preparation differs widely for the various professions or callings in life.
2. There must also be a pre-vocational period of training when the pupils should be finding themselves vocationally and trying themselves out to determine which calling in life they should follow and prepare for. During this period pupils should be given the kind of instruction and guidance which would help them to make a wiser choice of their life work and enable them to try themselves out, as it were, in several fundamental lines of work to determine in which line they are most interested, and for which they have the most talent and capacity. They should also pursue, during this period, those studies which would be generally helpful and which would give the best foundation for the work they expect to follow as their life calling.
3. There must be, in the third place, a period for vocational training proper, a period when the dominant aim of the instruction should be to prepare directly for the particular occupation the pupils expect to follow as their life work.

It is the opinion of the state department that vocational training which aims to prepare directly for a specific occupation or calling in life can not be given with economy or profit unless the right sort of foundation for such training has been laid. Beginning with the kindergarten and extending through the elementary and pre-vocational periods, there should be well co-ordinated hand and industrial work which would build up, in connection with the regular work of the school, such ideals of service, such a knowledge *about* and interest *in* the fundamental occupations of life, such habits of thinking and work, such powers of observation and control of all parts of the body as are a necessary prerequisite for all kinds of work.

The practical arts work in the regular school is, therefore, a very necessary and important part of our state program for vocational education. *It is the necessary preliminary step to efficient vocational training as such, a step that should not be omitted and upon whose successful solution very largely depends the success of all future vocational work.*

Three lines of practical arts work have been provided for by our law: Industrial arts, domestic science and agriculture.

3. WORK IN DOMESTIC SCIENCE

The Indiana law defines "Domestic Science" as any education which fits for occupations connected with the household. In a vocational school or department for home-making the dominant aim must be to prepare for the occupation of home-making, the student devoting at least half her time to the home-making work. (See Special Bulletin, Department of Public Instruction, Vocational Series No. 14.) As a foundation for this vocatoinal work and to give our young people a better understanding of and appreciation for this fundamental occupation, the law requires that elementary domestic science shall be taught in the grades of all city, town and township schools as directed and outlined by the state board of education and that this instruction shall be continued in all city, town and township high schools as the state board of education may direct. (See Indiana Vocational Education Law, Section 5, 1913.) As in the case of the industrial arts, work has been outlined by the state board only for the pre-vocational period.

a. AIM OF THE DOMESTIC SCIENCE INSTRUCTION IN THE REGULAR SCHOOL

The domestic science instruction given in the regular schools should be organized and conducted so it would accomplish the following results: (1) It should give to our young people a more intelligent appreciation for the important and fundamental occupation of home-making. (2) It should prepare them, so far as possible, for efficient and economic work in the home.

Much will depend upon the point of view and attitude of the teachers. Some teachers labor zealously and efficiently to teach the subjects of sewing, cooking, or home economics, and forget that it is the chief purpose of this instruction to give the pupils as much help as possible for solving the problems that are actually

encountered in doing home work. It is not the aim to present in a systematic way a body of knowledge about cooking, sewing and other subjects pertaining to the home, but to bring scientific principles and the best practices to bear on the problems actually encountered in the average home, to the end that these problems may be solved in a more efficient and economical way.

b. SCOPE OF THE DOMESTIC SCIENCE WORK

Any instruction which aims to train young people for the responsibilities and work of the home must concern itself with some or all of the following problems or lines of work:

1. Problems pertaining to the selection, production, preparation and serving of foods, involving a study, by the problem or project method, of such subjects as cooking, serving, gardening and marketing.
2. Problems pertaining to the selection, cleaning, repairing and making of clothing, involving a study, by the project or problem method, of such subjects as *sewing, laundry science, millinery* and the like.
3. The problems presented to the women who must take care of the home, including a study of such subjects as sanitation; personal and home hygiene; first aid to the injured; best devices for cleaning and sweeping; the care of furniture, floors, bedrooms, rugs; home nursing, etc.
4. The problem of managing the home, including a study of efficiency methods as applied to home work; keeping household accounts; a study of budgets; the care of children, etc.
5. Problems presented by the fact that all home-makers must properly furnish and beautify their homes. This involves the application of culture and art to the business of home-making, and includes a study of home furnishing, home decoration, house planning and the like.

It would take four years or more in a vocational school to do all this work well. Teachers should therefore not be too ambitious and undertake too much. The work should be so planned that whatever subject or subjects are taken up would be thoroughly taught, so that the work would not have to be repeated. Much will depend upon the methods of teaching used and the teachers' point of view.

c. METHODS OF INSTRUCTION

Three methods are at present used in this country and state to give instruction in the household arts.

1. The academic or so-called "Cold Storage" method. Where this method is used the girls are first given the required information about chemistry, food values, textiles and the like, by lectures, the use of text books, or laboratory exercises. Later they are taught to apply the knowledge thus gained to actual problems, or are left to make the application themselves as best they can when occasion demands. The method is well illustrated where mere text book work is done, or in its better form where teachers are in the habit of lecturing to their classes on certain days about things which are to be tried out in the laboratory or home later on.
2. The "Application or Project" method is followed where the girls learn their chemistry or the relative values of different foods, or acquire a knowledge about textiles as they need it in the practical work they are doing in the home or school laboratory. Each girl is given the needed help while she is actually doing the work. She is given a definite project or problem to work out and receives the necessary instruction and help while actually doing the work. She would, for example, be taught the principles of sterilization while canning vegetables or fruit.
3. A third method of procedure may be described as somewhat of a mixture of these two. The instruction is largely class instruction, not individual project work. The amount of application is usually limited and the practice work is carried on under conditions which are more or less artificial. The problems taken up are often artificial or imaginary. Theory is given first. The application comes later. Too little attention is given to applying the knowledge gained to the problems encountered in doing actual home work.

In all the domestic science work in the schools of the state the second or application method should be used. Scientific instruction and actual practice should go hand in hand. Practice without guiding principles makes the work mechanical and uninteresting. Theory without practice is unreal and profitless. Pupils should be set to work on real problems such as are encountered in actual home work. Where the experimental and practice work is done in the school, great care must be exercised to make the conditions for work as near like those encountered in the home

as possible. Garments should be made by the best modern methods that can be applied in the home, not according to some logical method which the teacher fancies is important, but which has long since been discarded by the most skilled and practical workers in the field. The cooking, mending, and laundry work done by the pupils should be actual work, not model exercises or the performance of artificial experiments. In sewing little or no time should be spent on stitches and model work. In cooking the preparation of actual meals should be encouraged and the importance of home practice emphasized. Every effort should be made to have the girls practice at home the things they have learned at school.

It is believed by the department, that economic learning in this field can not take place unless theory and practice go hand in hand in some such way as has been described. Practice work and co-operation with the home is absolutely necessary if the instruction is to be made real and truly worth while. Great care must, therefore, be exercised in planning and equipping the school laboratory and in making and administering the course of study in domestic science. People in Indiana do not yet cook with electricity and perhaps never will. Pupils should, therefore, not be taught to cook with electricity in the school laboratory. Mothers do not prepare a meal by cooking one thing at a time. The most economic and efficient method of preparing a well-balanced meal should, therefore, be emphasized.

d. NECESSARY TEACHERS, ROOMS AND EQUIPMENT FOR DOMESTIC SCIENCE WORK IN THE PUBLIC SCHOOLS

(1) Requirements for Rural Schools

(a) Teachers. The domestic science work in the rural schools must be done by the regular teacher in co-operation with the mothers in the home. It is very desirable to have a township or county supervisor to help the regular teacher with the work, and many county superintendents and trustees in the state have already made provision for employing special teachers for such supervisory work.

(b) Rooms and Equipment. The work must be done in the regular schoolroom and at home. The reading, study and demonstration work should take place at school, where facts and principles are taught. The practice work must be done in a special room to be provided or at home. For official lists of equipment needed see this Bulletin, Section D, pp. 111-114.

(c) Library Equipment. For a list of reference books and bulletins needed by pupils and teachers, see official list in Course of Study, this Bulletin, Section D, p. 108.

These books and bulletins should so far as possible be supplied by the trustees. If all the books can not be purchased in one year, half might be purchased one year and half the next. The boys and some local carpenter could make a case for the books where they might safely be kept. Some schools, by giving entertainments, have made enough money to buy a good library and all the equipment needed for the demonstration and practice work undertaken. This may be done wherever absolutely necessary. It is expected, however, that the trustee will provide all needed equipment.

(2) Requirements for Seventh and Eighth Grades in City, Town and Township Schools

In city, town and township schools more and better work can be done.

(a) Teachers. There should be a teacher or teachers specially trained and equipped to do all work undertaken.

(b) Rooms and Equipment. There should be a room and equipment needed for teaching the elements and practice of sewing. A room and suitable equipment for teaching the principles and practice of home cooking. This equipment should be adapted to meet the needs of the local community. It is difficult to make the conditions in a school normal for cooking and sewing work. In order to remove this difficulty some school boards have purchased or leased a house or modern flat for the domestic science work. This makes it easier to make the practice work normal and real and is strongly advised wherever it can be arranged.

(c) Library Helps. There should be adequate library materials for both teacher and pupils in the particular field of work taken up in the course. See this Bulletin, Section D, pp. 108-111.

(d) Character of Work. All work undertaken must be real and practical and, so far as possible, correlated with the drawing and art work of the school. The art department or teacher of drawing should assist in every possible way with the instruction in domestic art and such other phase of the domestic science work as are closely related to the work of her department.

No satisfactory correlation has as yet been worked out between

this elementary instruction in domestic science in the grades and the work to be done in the high school. But it is pretty clear that in the grades the practice side of the work should be emphasized and that whatever is attempted should be well done.

Teachers and county superintendents should in general not attempt to do more than one line of work. They should have their pupils study either *foods and cooking, textiles and sewing,* or *make a study of the home* along the line suggested in the state course of study. A county or township might take up one of these lines of work for all its schools, but for reasons that will readily appear that subject should be taken up which the teacher can teach best in her particular school. Such a line of work should be selected and begun at the opening of the school term and continued throughout the year.

A detailed course of study in (1) The study of foods and cooking, (2) The study of textiles and sewing, (3) The study of the home, and official lists of laboratory and library equipment for the domestic science work in the rural, graded and commissioned high schools, are given in this Bulletin, pp. 108-11 and 118-24.

(3) Requirements for Domestic Science Work in Commissioned and Certified High Schools

(a) Teachers. There must be a specially trained teacher or teachers for the domestic science work. It is far better to have a thoroughly qualified teacher and little or no equipment, than ideal rooms and equipment and an untrained and unskilled teacher. Township trustees may employ a special teacher to teach the domestic science in two or more of their schools.

(b) Rooms and Equipment. There must be a suitable room and the necessary equipment for teaching the principles and practice of home sewing. A laboratory and the necessary equipment for teaching the principles and practice of home cooking. A room 19 x 26 ft. will accommodate 20 pupils at a time, but a room 26 x 28 feet, or 30 x 40 feet would be better. The room should be on the top floor, so that the fumes will not interfere with the rest of the school work. The cooking laboratory must be well lighted and ventilated.

It is difficult to make the conditions in a school-room normal for teaching domestic science. It is also sometimes difficult to secure the necessary rooms for the work. In order to meet these difficulties some school boards and trustees have leased a house or mod-

ern flat for the domestic science work. This makes it easier to make the work real and practical and is advised wherever it can be arranged. It is the most efficient and inexpensive way of providing for the work, but for obvious reasons such a dwelling or flat should be located near the school building.

(c) Library Equipment. There should also be adequate library helps for both teacher and pupils. A suggestive list of suitable bulletins and books is given in the state course of study. See this Bulletin, Section D, pp. 118-124.

(d) Character and Amount of Work to be Done. All work undertaken must be real and practical, and, so far as possible, correlated with the drawing and art work of the school. The teacher of drawing should co-operate to the fullest extent with the teacher of domestic science, by adapting her instruction in drawing and design to the problems met with in the teaching of home sewing, home decorations and millinery. At least one full year's work must be provided for by all commissioned and certified high schools. The work should be placed on a par with other subjects offered in the course and provisions made for adding a second and third year as rapidly as possibly so that those desiring to do so might have an opportunity to specialize in this subject.

B. COURSE OF STUDY IN DOMESTIC SCIENCE FOR THE SEVENTH AND EIGHTH GRADES

1. Work in the Rural Schools

Three lines of domestic science work may profitably be undertaken in a rural school: (1) A study of the care, decoration, planning and sanitation of the home. (2) A study of clothing and practice work in sewing. (3) The experimental study of foods or demonstration and practice work in cooking. A detailed course of study in each of these fields of the domestic science work has been outlined below and official lists of library and laboratory equipment needed made out (see Section D, pp. 108-11 and 103-4).

2. Work in Town, City and Township Schools

In town, city and township schools more and better work can be done. No satisfactory correlation has as yet been worked out between this elementary instruction in the grades and the work to be done in the high school. It is pretty clear, however, that in the grades the practice side of the work should be emphasized and that whatever is undertaken be well done.

3. Only One Line of Work Should be Attempted

The work to be done in any particular school should be limited to one of the lines of work mentioned above. The teacher, in cooperation with the county superintendent, should, before school begins, select *one of the lines of work outlined below and follow the lessons and suggestions given on this topic in the state course of study.* It may not be possible to do all the work outlined on that topic. Each teacher should plan to do the work she is best prepared to do and which can to best advantage be done in her particular school in the time at her disposal. More work has been outlined in each field than any teacher in a rural school can do well. Great care should, therefore, be exercised not to attempt to do more work in that field than can be well done in the time that is available for the work. *The above discussion of methods and aims and the state course of study given below should be carefully and repeatedly studied by the teacher.*

4. SUGGESTIONS FOR TEACHERS

a. ENDS TO BE ATTAINED BY THE DOMESTIC SCIENCE INSTRUCTION

The chief aim of the domestic science instruction is to teach the children helpfulness in the home, to give them a right appreciation for the occupation of home-making, to teach them the value and proper use of the things brought into the home, and to give them the scientific and practical help needed to enable them to solve in an economic and efficient way the problems which the home-makers of Indiana are called upon to solve.

The problem confronting the teachers and State is to find the most practical method of securing these results.

There are at least five groups of problems that a home-maker in Indiana is called upon to solve:

(1) Foods. An efficient home-maker must be able to buy with judgment both prepared foods and raw materials; she must be able to prepare and serve meals and have some practical knowledge of the principles involved in the preparation of menus and the balancing of food values. The home-maker in the village and country must, in addition, have a practical knowledge of gardening, poultry and dairying, i. e., she must know how to produce much of the food used in the home.

(2) Clothing. Home sewing, dressmaking, the ability to buy either ready made garments or to purchase suitable materials for making garments, the care of clothing, washing, ironing, mending, removing stains, remodeling and making hats and children's clothing and the like, constitute a second important group of problems which the average home-maker in Indiana is called upon to solve.

(3) Care of the Home. The home may also be regarded in the same way as any other collection of articles which together are used for a specific purpose. In the case of a factory or business the building, equipment, etc., is called a "plant". In this sense the home constitutes a most important business "plant", whose care, upkeep, and management require special and adequate training if the work is to be properly done. The best and most economic devices for cleaning and sweeping; proper care of furniture, floors, rugs, bedrooms, etc., the value and purpose of disinfectants, getting rid of flies, mosquitoes and other insect pests, are some of the problems that might be mentioned in this field of the home-maker's work.

(4) Household Management. Home-making is an occupation to which efficiency methods may be applied with great advantage and profit. The average home-maker must deal with problems pertaining to sanitation, the feeding and care of infants and children, home nursing and care of the sick. She should learn how to plan her day's and week's work, how to keep household accounts, in fact how to manage her home in the most economic and efficient way.

(5) House Planning, Home Furnishing and Decoration. Over and above the four groups of problems mentioned above, which deal more or less specifically with the *maintenance* of the home, stands another important group of problems which deal more specifically with the application of the elements of culture and art to the business of home-making. The ability to deal in a practical way with the application of the principles of art as they come up in such questions as the furnishing of the home, the beautification of the home and its surroundings, landscape gardening, etc., represents another important group of problems for the home-maker, though we may not know just how practical help for their solution can best be given.

Students can not be trained for efficient home-making in a few lessons or weeks. It takes careful instruction and training in special courses or schools organized and conducted to fit specifically for this particular occupation. *But whether the instruction is given in a regular school, or in special courses or schools designed to prepare specifically for the occupation of home-making, each lesson should give definite help for the solution of some of the problems indicated above.*

b. METHODS TO BE EMPLOYED IN THE DOMESTIC SCIENCE WORK

Any instruction in domestic science to be practical and real must give help along some or all of the five lines mentioned above. Merely imparting to children a certain amount of information *about* cooking, sewing or the care and management of the home will not suffice. The instruction and training must be of such a nature that *real help* will be given for the solution of some of the actual problems which the home-maker is called upon to solve.

Carefully planned instruction and *actual practice* must go hand in hand if efficient results are to be attained. Pupils must be set to work on problems such as are encountered in an actual home. The conditions under which the work is done must be made as near

as possible like the conditions encountered in the home. Garments should be made by the best modern methods that can be used in the home. The work in sewing should include help in the selection of materials as well as help on the cutting and sewing side. The mending and laundry work done by the pupils should be actual work, not model or artificial experiments. The preparation of actual meals should be encouraged and *every effort made to have the girls practice at home the things studied or learned at school.* There can be no real learning in the subject of domestic science unless scientific instruction and *actual practice work* go hand in hand.

c. NEEDS OF LOCAL COMMUNITY MUST BE CONSIDERED

The conditions and needs of the local community must be considered. The teacher should make herself familiar with the community in which she is teaching in order to be able to select the projects which best meet the needs of that particular locality, then proceed to work out these problems with her class. In a poor district the problem of giving helpful instruction in domestic science is different from the problem in a more prosperous community. If the problems suggested in the course of study do not fit the conditions they should be changed. The essential thing is teaching the children helpfulness in the home, giving them a right appreciation for the fundamental occupation of home-making, and giving them as much help as possible for solving efficiently and economically the problems which the home-makers in that particular community are called upon to solve.

d. HOW TO MEET CRITICISMS

Do not become discouraged in communities where the domestic science work is criticized. The teacher with determination and tact will overcome these difficulties if she will be careful to do well everything she undertakes. Do not begin work which you can not prepare to do well in your school. Give the pupils definite help on the problems they meet in their home work. Read carefully the introduction to this course of study and the above suggestions for teachers at least once each month. They will help make your work more real and valuable. Be as tactful as you can; plan to do well everything you undertake and the results will take care of themselves. If in trouble or doubt about any of the work write to your county superintendent or to the Vocational Division, State Department of Public Instruction, for further suggestions and help.

5. Lessons in Cooking and the Study of Foods Outlined by Months and Weeks[1]

In teaching cooking as outlined in the state course of study teachers often feel themselves handicapped because of a lack of equipment. There are three methods which may be followed in teaching cooking:

1. The laboratory method, requiring equipment and space enough for each girl to do individual work.
2. The observation or demonstration method, requiring only equipment enough for giving demonstration work in cooking before the class.
3. The home project method, requiring practically no equipment in the school, but great skill on the part of the teacher directing and planning the work so that the child becomes interested enough in the work at school to go home and apply what has been learned at school.

Two sorts of work in cooking may be done: (a) An experimental study of foods may be made followed by practice work in the home along the lines of study taken up in the school. (b) Demonstration and practice work in cooking. The former can be done in any rural school if the teacher is interested and has had some training, or will work out the problems taken up for herself. *Practice work in cooking can not be successfully done unless a separate room or compartment can be fitted up for the work.*

For a statement of the equipment needed for practice work in cooking and the experimental study of food see official list of equipment, Section D, pp. 111-113.

September

First Week.

The Kitchen. Several general rules can be given for the plan of a good kitchen, but detailed rules should never be made unless all conditions are understood. A kitchen should be the most sanitary room in the house; by sanitary we mean a room that can be kept clean easily, can be aired well and can have plenty of sunlight entering sometime during each day. The location considered best

[1] The following lessons in cooking and sewing were prepared at suggestion of department by Mary L. Mathews and Lella Gaddis, Department of Home Economics, Purdue University.

for the kitchen is on the north or south side of the house rather than on the east or west, because the afternoon sun is unpleasant in doing afternoon work, and often in the mornings the kitchen becomes unpleasantly warm from the sun. There should be windows or doors so arranged that there will be cross-ventilation. The walls and floors should be washable. Never cover a kitchen floor with a carpet. Linoleum is best where it is necessary to cover the wood. Walls should be painted or papered with washable paper —the former is the better plan. Light colors should be used in painting wood-work or in finishing walls, because if the kitchen is to be kept clean the dirt must be easily seen. Built-in cupboards are more easily cared for than movable ones because they do not have to be moved in cleaning. A sink makes a kitchen much more convenient and can be arranged even in the country. Porcelain sinks are best, but expensive. White enamel iron ones are good and not high priced. Chairs, a high stool, a table on castors, a stove and cooking utensils are the necessary equipment for a kitchen. A kitchen should be large enough to do comfortably all the work necessary to be done there. A kitchen should not be used as a sitting-room, it should not be used as a laundry and should not be used as a place of storage. Large kitchens are not considered best because of the many steps the extra space makes for the housewife.

A discussion with the pupils as to the equipment necessary in a well arranged kitchen would be interesting. If there is no laboratory in which to have different articles of equipment used, pictures will answer in explaining the use of measuring cups, spatulas, etc. Often the making of a booklet on "The Kitchen" will bring before the child's notice something about plans, arrangement and equipment. *Always be careful to present the work in such a way that the child does not become dissatisfied with conditions at home.*

The laboratory work should consist in a discussion of the clothes to be worn in the kitchen or laboratory. The girls should be told that all clothing for kitchen wear should be washable; that wool or silk are not suitable. The laboratory apron should be white and should be made with a bib. Cap and sleeves are not necessary. White material is best because it teaches the child to be careful in wearing an apron, and also as the dirt shows so easily the apron will be changed when soiled. If there is to be laboratory work done a list of equipment should be made and the use of each article discussed.

The laboratory work this week should consist of the taking of

temperature of water at boiling, hard boiling, simmering and in a double-boiler. A chemical thermometer can be used and can be purchased for a dollar. If there is no laboratory equipment a small alcohol burner will furnish the heat necessary and a double-boiler can be borrowed for the purpose.

Second Week.

Stoves and Fuels. The most common fuels are wood, coal, kerosene and gas. Wood is of two kinds, i. e., hard and soft. Soft wood produces a quick fire but one of short duration. Hard wood burns much more slowly but the fire lasts longer than one made with soft wood. Make a list of the hard and soft woods found in the community.

"Coal is of many kinds and is all formed from ancient vegetation which has been buried deep in the earth for a long time and subjected to a high degree of heat and pressure. Coal has a higher kindling point than wood, burns with a strong steady heat for a long time and holds fire much longer than the hardest wood." (Bailey.)

Kerosene or coal-oil is made from petroleum. It is a cheap fuel and is fairly safe if the stove is kept clean and in good condition.

Gas is either natural or manufactured. Natural gas can only be used in localities where it is found. Artificial gas is made from coal, petroleum, oil, wood or peat.

Gasoline is not safe to use in schools but can be used safely in homes where the proper care is exercised.

Stoves for different fuels vary greatly in construction. In buying a stove select one with little trimming. A stove should be so arranged that it can be taken apart and cleaned easily. In a coal or wood range drafts should be carefully examined to determine whether they are properly arranged to control currents of air. When fuel burns it gives off a gas called carbon dioxide, which is invisible. Smoke and soot are largely waste as they contain bits of fuel that have not been properly burned. In the laboratory, if there is a stove or range, a demonstration in the proper laying and kindling of a fire should be given. If this is not possible a cross section drawing of a range showing the drafts and their action should be explained.

Canning fruit should be the work given this week. While this work is not the easiest work upon which to begin, yet it is necessary at this time because there will be no fruits available later. Proper sterilization means success in fruit canning. By complete

sterilization is meant the heating of fruits, jars, lids, and rubbers at the boiling point until all bacteria have been killed. Successful canning requires complete sterilization followed by quick sealing of the fruit in the can in such a manner that the air is excluded from the fruit. Jars, lids and rubbers should be put in cold water; placed on the fire and allowed to come to boiling point and then boiled twenty minutes. Do not remove the jars from the boiling water until fruit is ready and do not wipe or handle the jar when filling. Glass jars with glass tops should be used because they are most easily kept in a sanitary condition. Any cook book will furnish receipts for canning. *If the work cannot be done in the schoolroom directions for doing the work at home should be given and the resulting product brought to school.*

If there is no laboratory work possible an experiment in the preservation of food might be made. Fill four test tubes about half full of water. In each place a few small berries or pieces of apple or pear. Plug each tightly with cotton. Put one aside and label (a), place the others in cold water and gradually bring the water to boiling point. Take one tube out when water has reached simmering point and label (b); take out a second the moment the water boils and label (c); remove a third after the water has boiled half an hour and label (d). Set all tubes aside in a warm place and watch for several days to determine which were successfully sterilized, which will be indicated by their not spoiling. This illustrates the principles of sterilization in canning.

Third Week.

Fruit. Fruit is used by the plant as a means of attracting birds and insects so that the seed contained in the fruit may be carried and thus propagate the species. Our cultivated fruits have all been developed from wild varieties. *Make a list of fruits growing in the locality.* Fruit is very wholesome and should often be used in the diet. Fruit to be good for food must never be overripe or green. Green fruit causes digestion disturbances because of the large amount of cellulose present and because of the excessive amount of acid present in the fruits. Decayed fruit is overripe fruit. The fruit is decayed because molds, a kind of plant, have developed and later on, in the process of deterioration, there are bacteria. Therefore, in canning fruit, ripe fruit should be chosen which has not begun to decay, because it is easier to sterilize such fruit. As fruits cannot be used fresh at all seasons it is necessary

to preserve fruits in different ways. The oldest method is that of drying and there are many dried fruits on the market such as figs, raisins, prunes, etc. Sugar, spices and salt are all preservatives, but using these with fruit destroys the original flavor. Fruits may be preserved for short periods by keeping at a low temperature. Canning fruits is the best method known.

List the fruits that are usually dried and those that are canned. Have a discussion about buying fruits and make their selection plain, by using examples of good and bad fruit.

The laboratory work this week should include the making of preserves and jelly. The best fruits for jelly making are fruits that are not entirely ripe because they contain more pectin, a substance which gives fruits their jelly forming property.

If there is no laboratory work possible in the school-room the following experiment may be used. Use the juice from several different kinds of fruit. Heat two tablespoonfuls of juice and add to this two tablespoonfuls of alcohol. If the mixture becomes thick like gelatin it shows the presence of pectin, an ingredient of the juices of ripe fruits, which determines their jelly-making properties. Test each juice to determine its value for jelly making.

Fourth Week.

Definitions in Food Study. Food is that which when taken into the body builds and repairs tissue and produces heat and energy. All foods are made up of different parts called food nutrients, and of these there are five that are of great importance, i. e., protein, fat, carbohydrates, water and mineral matter. The food nutrients that build tissue are protein, mineral matter and water; those that produce heat and energy are protein, fat and carbohydrates.

Foods are classified according to the food nutrients which they contain. Protein foods are such foods as meat, eggs, milk, legumes and cereals. Carbohydrate foods include the fruits and vegetables. Examples of foods containing a large per cent of fat are butter, olive oil and nuts. A great many foods under the other classes contain fat. All foods contain water and mineral matter. If the body is to be properly nourished there should be all the food nutrients represented in our meals. When meals are arranged in this way a "mixed diet" is said to be used.

Vegetarians do not eat any animal food but get protein from the cereals and legumes. Protein furnishes both building material and heat and energy, but protein foods cannot be used in a

diet alone because they are too concentrated and because the system needs bulky material which is furnished by fruits and vegetables.

The laboratory work this week should consist of making pickles. Pickling is preserving in acid or brine. Vinegar and salt with spices are generally used. To illustrate how these materials act as preservatives the following experiment may be performed. Place a slice of fruit in a small bottle, cover with water and seal. Cover a second slice with vinegar; a third with salt; a fourth with sugar and a fifth with ground spice. Allow these to stand for a week in a warm place and determine which materials are preservatives. *At the end of this week if the home method of teaching has been used it would be well to have an exhibit of the canning work done in the homes.* The fruit should be scored with a score card and criticisms made.

OCTOBER

First Week.

Carbohydrates. The food nutrient known as carbohydrates is found in foods in the forms of starch, sugar and cellulose. Therefore all foods that contain these can be said to contain carbohydrates. Fruits and vegetables are the foods in which the largest per cent is present.

"Cellulose is the substance from which the framework of the plant is built, it gives rigidity to certain parts and if these plants are used as food the greater proportion of cellulose contained, the more difficult will be their digestion. There is more cellulose in the older parts of the plant, as the stem, than in the leaves and fruit." (Bailey.) Absorbent cotton is an example of almost pure cellulose. When choosing fruits or vegetables, those that are young and fresh should be used because the cellulose is in a more digestible form. Cellulose softens in long cooking but its chemical form is not changed.

Starch is contained within the cellulose walls of plants. It is the form in which the plant stores food. The starch is found in the form of granules in the cells of the plant. Starch grains are of many shapes and sizes. When starch granules are boiled in water they lose their shape and break up, forming a paste. When vegetables are cooked the starch in them is affected in this way. Cold water does not affect starch. Sugar is the circulating form of carbohydrates found in plants. Sugar differs from starch in

appearance, in its sweet taste and in being soluble in cold water. All starch is changed into sugar after it is eaten and before it is absorbed by the body. Fruits contain a large per cent of sugar. Some vegetables like corn contain sugar.

The Laboratory Work. This week will begin the cooking of vegetables. Boil a potato and bake a potato. Potatoes should never be allowed to soak in cold water after being peeled because this allows some of the starch to soak out. Use boiling water in which to cook potato and allow it to boil briskly. Never allow a potato to stand in water after it is cooked.

A potato that has been baked should be pierced with a fork or broken as soon as taken from the oven. This is to allow the escape of moisture that makes the potato "soggy."

If no laboratory work can be done the following experiments will illustrate principles in regard to starch and its cookery:

(1) Action of Cold Water on Starch—To ¼ teaspoonful of cornstarch add 2½ teaspoonfuls of cold water. Mix thoroughly. Allow it to stand until starch settles. When water is clear drain it off and dry starch. Drew conclusions.

(2) Action of Boiling Water on Starch.—To 2½ teaspoonfuls boiling water in a test tube add ¼ teanspoonful dry starch without stirring. Examine the lumps. Starch lumps, when mixed with hot water direct, because the starch granules have not be separated enough to form a smooth mass with the water.

(3) Action of Heat on Cold Water Mixture—To ¼ teaspoonful cornstareh add 2½ teaspoonfuls cold water. Mix thoroughly and continue to stir while heat is applied. Use a thermometer to note when clear. What has become of starch granules? Dilute with water. Draw conclusions. (These experiments are given by Nelson in "Hand-book of Domestic Science.")

Second Week.

Vegetables. Vegetable foods are divided botanically into the following groups:

1. Cereals, such as wheat, oats, corn.
2. Pulses, such as peas, beans.
3. Roots and tubers, such as carrots, turnips, potatoes.
4. Green vegetables, such as cabbage, lettuce.
5. Fruits and nuts, such as apple and walnut.
6. Fungi and algæ, such as mushrooms, Iceland moss.

Make a list of all the vegetables found in the community, placing them under the various divisions.

When vegetables are studied from the food standpoint they are divided into two large groups. (1) All those that contain a large per cent of starch and cellulose, known as starchy vegetables. (2) Those that contain practically no starch but a great deal of cellulose, called succulent or green vegetables. The first group is rich in food value but the latter group is largely used to furnish variety and flavor and to add bulky material which is helpful to digestion when not present in too large amounts. The starchy vegetable group includes potatoes, rice, macaroni, beans, peas, corn, wheat, oats. The succulent vegetables are cabbage, celery, lettuce, turnips, onions, tomatoes, spinach, cucumbers. In planning a meal such as dinner it is best to have representatives from both classes on the menu. The starchy foods are cooked to break up the cellulose in the plant and change the starch grains so that they can be more easily digested. The succulent vegetables are very often eaten fresh without cooking, as in salads.

The laboratory work should consist in making white sauce. A white sauce is a mixture made of a liquid, a fat, and a thickening agent. Cream sauces, gravies, purees are all white sauces flavored in different ways. In making a white sauce use the double boiler when milk is the liquid used. Heating the liquid, adding the fat and thickening agent mixed together, and stirring carefully is the easiest method for beginners. White sauces vary in thickness according to their use. No. 1 is thinnest and is made with 1 cup liquid, 1 tb. fat and 1 tb. of flour or $\frac{1}{2}$ tb. of cornstarch. In the thicker sauces the flour is varied and the sauces are known as No. I, No. II, No. III, and No. IV white sauces.

Where no laboratory work can be done, a more careful study of starch can be made. Place a very thin slice of potato under the microscope and examine starch cells and make a drawing. Cut up a potato into thin pieces and place in cold water. Let this stand for several hours. Remove the potato and allow the liquid to settle. Drain off most of the liquid, thoroughly stir the remainder, and boil. The white sediment in the bottom of the pan is starch. Boil a piece of potato for a few moments. Remove from water. Drop iodine on the potato. Iodine turns starch a purple blue.

Third Week.

Potatoes and Rice. In the United States in 1911 over 292,000,000 bushels of potatoes were raised. This is far ahead in quantity of any other vegetable produced. The potato is a native of Chili,

Peru and Mexico. For a long time the potato was cultivated only in Virginia, having been brought there by Spanish explorers. Later it was carried from Ireland into the New England States. In 1777 it was still regarded in England as only fit for stock food. Potatoes are easily kept when properly stored. They should be kept where the temperature does not go below 35° F. If potatoes have become wilted in storage they should be soaked in cold water until crisp before peeling. This takes several hours. Just under the peeling of a potato there is a great deal of the mineral matter and protein found. When very thick peelings are cut off in preparing the potato for cooking, practically all this material is lost. If cooking is continued so long that the potato breaks apart, there is a loss of food value unless the water in which the potato was cooked is used for soup. When potatoes are boiled with their "jackets" little food value is lost. Baked potatoes lose little food value. Raw potatoes are not easily digested because the starch and cellulose have not been broken up. Potatoes should not be used as a diet alone because they do not contain enough protein.

Rice was introduced into this country in 1694. Some rice is grown in the Southern Atlantic and Gulf States, but we annually import from foreign countries five times as much as we raise. Rice contains a large per cent of starch and is very valuable as a food. Starch grains of rice are small. Rice will absorb five times its weight of water when cooked. The best method of cooking rice to save all the food nutrients is by steaming. Rice is easily digested. Rice can be used as a substitute for potatoes in the diet because it is of similar composition.

The laboratory work should be the making of escalloped rice. Cook the rice in four times its weight of boiling salted water. Use No. II white sauce. Cheese may be added to the white sauce to give flavor. Escalloped dishes should be baked in earthenware utensils, always well greased before using. White sauce and vegetables should be placed in alternate layers and the top covered with buttered bread crumbs. Where laboratory work is not possible a few tests in measurements may be made.

Determine No. of tp. of water in 1 tb.
Determine No. of tb. of water in 1 measuring cup.
Determine No. of cups of water in 1 quart.
Determine No. of tp. of flour in 1 tb.
Determine No. of tb. of flour in 1 cup.
Determine No. of cups of flour in 1 quart.
(Flour should be sifted once before using.)

If possible determine number of cups in 1 lb. of flour, of sugar, of lard. Always use level measurements.

Fourth Week.

Macaroni. This starchy food is made from hard wheat. It is drawn, molded or stamped in various forms and is known in trade as macaroni, vermicelli, spaghetti, noodles, Italian paste and similar products. The largest amount of macaroni wheat is raised in Russia. The wheat is washed, crushed and sifted so that only the finely ground parts from the grain are used. This flour is mixed with water in long troughs and a stiff paste formed. This is then passed into a perpendicular hydraulic steel press, the bottom of which is perforated with holes and in the center of each hole is a pin attached. As the paste is pressed down it passes through the perforations and long tubes are formed from the dough. These are tough and not easily broken. The strings of tubes are cut up into three feet lengths and are allowed to dry on racks in the sun. After this first drying process, the product is stored for twelve hours in a cellar to allow the moisture to become better distributed. It is then dried for several days, sometimes in the open air or sometimes in a properly constructed chamber. Spaghetti consists of smaller sized tubes than macaroni. Vermicelli is the paste molded into different forms such as letters and numbers and is usually used in soups. These foods were originally used in Italy, but are being eaten in large quantities in this country now. Macaroni in cooking will swell and absorb as much as three times its weight of water. It is a very valuable food because, besides containing a great deal of starch, it contains considerable protein. It is never necessary to have potatoes or rice in the same meal with macaroni. *An exhibit of each of these foods might be purchased showing the girls in just what kind of packages these are sold.* Different methods of cooking macaroni should be discussed.

The laboratory work should consist in making an escalloped dish of macaroni and cheese. Experiments that may be performed are as follows:

Heat some cane sugar (granulated) in a frying-pan over the fire, stirring constantly until the sugar melts. This product is known as barley sugar. Continue heating the mixture and there will be chemical changes take place which cause the sugar to acquire a dark color and a peculiar taste. This is caramel and is used for flavoring custards, icings, etc.

Place a small quantity of sugar in some cold water. Stir well. Does sugar act like starch? Determine which dissolves sugar the quickest, hot or cold water.

November

First Week.

The Study of Green Vegetables. Structure and classification of vegetables. Green vegetables have a decided place in our diet in that they give to it variety, which is an essential, and mineral matter which gives to the body rigidity, and bulk, a third necessary factor in the diet.

Many vegetables, especially potatoes, beets, turnips, carrots, cabbage and onions, may be stored in the cellar for winter use. Two of the most commonly stored vegetables besides potatoes, which were taken up in the lessons for October are cabbage and onions. Review pp. 28-9 above.

Cabbage was probably first cultivated by the Germans or early Saxons and was used by the Greeks in Rome in early times. The English were rather slow in its acceptance but the Scotch and Irish were especially fond of it. The leaves rising from the root stalk grow together in such a manner that a compact head is formed, the light being excluded from the inner leaves, they become crisp and tender from lack of chlorophyl. Cabbage contains about 91% water, it therefore cannot be of high food value. However, there is both sugar and starch present and a little protein and mineral matter. Cabbage being rich in cellulose is not easily digested, but is valuable as a variant in the diet.

Onions. The onion belongs to the lily family and is especially valuable for the flavor which it imparts to other foods. This flavor being due to a volatile oil compound containing sulphur. The original home of the onion was probably in Southern Asia or in the countries surrounding the Mediterranean Sea. It is readily grown from the seed or onion set and when young the entire plant is often eaten. Onions are best grown where there is an abundance of moisture. To be successfully stored, they must be thoroughly dry, and kept at a low temperature (just above freezing), with plenty of good ventilation. Onions may be cultivated over large areas in temperate climates, and even in tropical climates.

In the United States, the onion holds the third place among truck crops—14,000,000 bushels valued at $10,000,000 have not only been grown, but consumed in a single year in the United

States. The most common varieties in use are the white, red and Bermuda. The bulbs grown in Spain and Portugal are imported to Great Britain, while those grown in Bermuda are imported to the United States, and are of a more delicate flavor than those grown in northern climates.

Laboratory Work. Have children make a list of all the green vegetables used for food and discuss best season of year for their use.

General Directions for Preparing Vegetables:

(1) Wash thoroughly, if necessary use a brush.
(2) Pare, peel or scrape if skins must be removed.
(3) Soak in cold water until ready to cook. (Keep crisp.)
(4) Cook in freshly boiling salted water until tender.

Proportions 1 tsp. salt to 1 qt. of water. Use just as little water as possible to save mineral matter. Cover vessel loosely so that steam may escape, otherwise the vegetables will be of bad flavor and often a poor color.

(5) Drain off water, and *serve hot.*

To Prepare Stuffed Onions. Wash onions thoroughly and peel under water. This prevents their hurting the eyes. Cook according to above directions. Remove core, fill with buttered bread crumbs. Brown in oven and serve with White Sauce No. 2. (See directions given in October lessons for making of White Sauce, p. 28.) Why serve with White Sauce?

Should time permit prepare escalloped cabbage. Discuss other methods of cooking cabbage; the reason for the addition of fat and protein being added. *Encourage children to prepare these dishes at home.*

If no laboratory work is given, a discussion of storage might be taken up. Compare home commercial methods, bringing out points favorable to satisfactory storage, namely: vegetables or fruit must be free of bruises or soft places and in as near perfect a condition as possible. The room or cellar must be clean, cool, darkened and dry. An experiment might be made by bringing into the schoolroom an apple bruised, and a perfect one. Leave each in the warm lighted room to see how soon they are affected by the heat and light. Two other apples might be used, one solid and one bruised—placing bruised place against the perfect apple to see how soon the perfect apple begins to "spoil." Conclusions?

Second Week.

Preserving Vegetables and Fruits. Two other methods of preserving green vegetables and fruits in the home are by canning and drying. It is said that the ancient Greeks and Romans preserved fruits by canning. By experience they learned that the simple principle of sterilizing the product by heat, then sealing it in vessels so that the air was not admitted, would keep the food indefinitely.

Canned vegetables are inexpensive because they are put up during the season when abundant. They add variety to the diet; and a good flavor is also retained. A comparison of home canned vegetables with commercial products, as to price,[1] quality and quantity, color and flavor should be made.

Most vegetables and fruits are best when fresh, but since they can not always be obtained, preservation by drying, has long been a practical means of keeping them for use during the season when not growing. From the beginning of civilization, drying, a method aiding nature's processes, has been used. Seeds dry as they ripen and berries dry on the bushes. Pumpkin was often dried in strips by the Colonial housewives. Green beans in pod, peppers, and sections of apples were often strung and hung where they would dry readily. The bulk and weight of such food (due to the evaporation of water) is greatly reduced, and therefore it requires less room for storage and less labor in moving from place to place. The

[1] The following actual case is probably typical of what may be accomplished in this line: On September 21, 1914, Mrs. ——— went to the Indianapolis market and bought one-half bushel of string beans, one-half bushel of tomatoes, nine dozen cucumbers for pickles, one-half basket of grapes for conserve. She did the marketing and her regular housework, canned the tomatoes and beans, made her pickles and grape conserve, and cleared $6.64 by the transaction. She worked about six and a quarter hours on the canning, netting her a little more than one dollar per hour for the time she worked, counting actual cost of materials used, and market prices paid the store for the same amount of food. The following is a detailed statement of the completed transaction:

I. Cost ½ bushel beans, 35c, gas 17c; total cost 52c. Result, 13 qt. jars beans. These cost at store 15c per jar or $1.95.
Gain on beans.....$1.43

I. Cost ½ bushel tomatoes 30c, gas 15c; total cost 45c. Result, 15 jars tomatoes, which sell at store for 18c per jar, or $2.70.
Gain on tomatoes.....$2.35

III. Cost cucumbers 15c, vinegar 10c, sugar, 3c, spice 1c; total 29c. Result, 5 jars pickles, which sell at store at 20c per jar, or $1.00.
Gain on pickles.....$0.71

IV. Cost ½ basket of grapes 7c, 1½ lbs. sugar 12c, raisins 10c, oranges 6c; total cost 35c. Result, 8 jars conserve, which sell at store at 20c, $1.60, and 2 quarts grape juice, which sells at 45c, 90c.
Gain on transaction.....$2.15
Total gain, $6.64.

success of drying depends upon the evaporation of water, because yeasts, molds and bacteria, thrive only where there is moisture, proper food and a warm temperature.

The value of dried fruits is not generally appreciated, mainly because they require less labor in preparation and are cheaper. The older products were sometimes damaged by dust and insects, now these difficulties, are easily overcome. Some of our choicest fruits and vegetables are now dried. When properly soaked and cooked, quite as much food value is obtained from dried foods as from fresh foods similarly cooked.

Laboratory Work. Prepare Cream Tomata Soup. If laboratory is large enough, use one can home-canned tomatoes and one of commercial product. Compare as to quality, color and flavor.

Make prune whip, using dried prunes which have been soaked over night, or for a couple of hours. Cook until tender. Taste without sugar, to see the amount of carbohydrate in the form of sugar present. (Review lessons for October, pp. 26-7.) When sugar and white of egg are added, the dish is a most palatable one, besides one containing protein, mineral matter, carbohydrate and water. (Classify according to September Lesson. This bulletin, pp. 25-6.)

Where no laboratory work is given different kinds of dried fruits of approximately the same size might be placed in equal measures of water and allowed to stand for an hour or different lengths of time. The vessel should then be drained and the remaining water measured to determine the amount of water taken up by the fruit.

Even in a rural school where there is only a heating stove, the following experiment might be made, to illustrate preservation by drying. Pare an apple or apples. Cut in eighths. Remove cores and place apple upon a plate over boiling water. Turn the fruit several times during the first two hours. Continue drying over steam for from four to five hours, then place loosely in a cheese cloth bag and hang in current of air, stirring the contents occasionally until thoroughly dry.

Third Week.

Salads and Salad Dressings. Salads have a distinct place in the diet.

(1) It is an attractive means of using vegetables.

(2) Valuable because of mineral salts in vegetables.

(3) They provide a means of adding fat to diet, i. e., cream and olive oil add fat in a way in which it might not otherwise be used.

(4) Salads also serve as a means of using left-overs.

(5) They often add attractiveness to the meal and therefore are valuable because attractive dishes are eaten more readily and are more easily digested.

The classification of salads is based upon the materials used:

(1) *Simple Salads* are made of salad vegetables when young and tender and are prepared without cooking. Such vegetables include water cress, celery, pepper grass, dandelions and lettuce. (Review work for September and October, Structure of Vegetables, pp. 25-30.)

(2) Salads made from other uncooked vegetables, such as cucumbers, tomatoes, onions, cabbage, sweet peppers. Fruits and nuts such as apples, bananas, oranges, grapefruit, pineapple, cherries, grapes and English walnuts, pecans, almonds, peanuts, etc.

(3) Salads made from cooked vegetables such as potatoes, beets, carrots, peas, beans, cauliflower. Also meats, fish, eggs, chicken, tongue, salmon and other left-overs.

General Rules for Making and Serving Salads. Use good ingredients. Arrange daintily and attractively and serve *cold.* Add the salad dressing to "simple salads" just before serving. Why? Serve with a heavy meal because the food nutrients obtained from other dishes served in the menu furnish enough food value with the addition of a salad to give a large amount of food nutrients.

Where mixing or stirring is done, always use a fork, because the salad will be more thoroughly mixed and not mashed or crushed. A steel fork or tin spoon left in the salad for a short time might be the cause of poisonous compounds being formed. For this reason a silver, wooden or aluminum fork should always be used.

Heavy salads such as meat, egg and vegetable combinations should be served as the main dish because of the food content.

Fruit salads are valuable for the mineral matter, carbohydrate in form of sugar (see pp. 26-7 above), and the variety which they give to the diet. Have children make lists of salad materials commonly used in the home, classify and discuss the value of each as an element of diet.

Salad Dressings. There are three classes of salad dressings.

(1) French—a combination of equal parts of oil and vinegar or lemon juice, with flavoring, blended, without being cooked. (Discuss value, and combination with which suitably served.)

(2) Mayonnaise, in which oil, vinegar, egg and seasoning are combined without being cooked. (Discuss food value and use.)

(3) Cooked dressing which is best known and used more than other types. This is made on basis of White Sauce. (See pp. 28-29 above.)

Laboratory Work. Potato Salad. Wash potatoes thoroughly, and boil with jackets one, so that little of food value will be lost. Let cool, peel and dice. Also cook an egg by putting in pan of boiling water, place on back of stove for 40-45 minutes in warm place. (Eggs are a protein food and should be cooked at low temperature for a long time.) For this salad prepare boiled dressing as follows:

2 girls—(½ recipe)
1 tsp. salt
½ tsp. mustard
1 tsp. sugar
½ c. milk
2 tsp. butter
¼ c. vinegar.

Mix dry ingredients similar to White Sauce before adding vinegar, and egg—yolk and white beaten separately. Serve on lettuce leaves which have previously been thoroughly washed, dried between folds of a *clean* towel and thoroughly chilled. Have children arrange salad on plate and serve one another for practice serving.

Where no laboratory work is given, a few simple experiments showing preservation by means other than storage, canning or drying may be used. Pare a ripe apple or pear, cut into quarters.

(1) Place one piece on plate and expose at room temperature.

(2) Place another piece in small bottle. Cover with water and seal.

(3) Place another piece in bottle of vinegar.

(4) Cover another piece with ground spice. Let Nos. 2, 3 and 4 stand for several days if possible and compare with (1).

Fourth Week.

Cereals. "A cereal is any grass grown for its edible grain, the plant as a whole or the grain itself."

Cereals are valuable because they contain all five food principles. (Review work for September, fourth week, pp. 25-6 above.) The general average is about two-thirds carbohydrates, one-tenth

protein, one-tenth water, and a little fat and mineral matter. Because of the large amount of carbohydrates they contain cereals are chiefly valuable as fuel foods. The amount of protein makes them also worthy of consideration as tissue builders. Protein foods are usually expensive, therefore cereals are valuable because of the cheapness, and can often be substituted to some extent for the more expensive foods, such as eggs, meats, etc.

Richest in protein content are oats, wheat, corn and rice. Cereals rich in protein are poorest in starch.

Oats is a very valuable cereal which has never been discovered growing wild. It must always be cultivated and is used as food by both man and beast. It was first grown in Europe 2,000 years ago and in Great Britain for more than 600 years. It requires a climate cool and moist, during the growing season. It is much more susceptible to drought than wheat and other grains. In Scotland oatmeal has long been used for food and within the last forty years it has been one of the most important breakfast foods in the United States. In the milling process all the cellulose *is not* removed. This, however, has the advantage of stimulating intestinal action.

Corn. Indian Corn was not known to the civilized world until the discovery of America. Today, in the United States at least, it ranks next to wheat as a cereal used in the home. It can be grown anywhere in the temperate zone, but until recently, has been cultivated in the western hemisphere only. At the time of the crop famine in Ireland it became so generally cultivated and used, that it now holds an important place as a cheap food material.

Corn is an important agricultural crop in Indiana, Illinois, Iowa, Missouri and Kansas. In the Southern States, corn products are used more extensively than in the other States. Corn meal, the chief manufactured product, is prepared by grinding the corn thoroughly, sifting it, or "bolting" as it is called, thus removing the outer covering or husk. In this process the portion of the grain known as the germ, which contains the fat, is removed. If this were left in it would cause the corn meal to become strong and stale, but when removed in the milling process, corn meal becomes an easily stored product. Corn meal is valuable because it is a carbohydrate food, is cheap, and can easily be cared for in the home.

Many different methods are used in preparing cereals. Certain principles, however, are always to be considered.

(1) The cereal is cooked to sterilize it. (Review work for September, Lesson on Sterilization, pp. 24-25 above.)

(2) To improve flavor and appearance.

(3) To make it more digestible. (Review work for October, Lesson on Carbohydrate Foods, p. 26.)

Laboratory Work. Have children make a list of ready prepared cereals with which they are familiar; also a list of cereals to be cooked; naming grains from which each is made. Discuss storing of cereals by means of glass jars, and tell *why* advisable.

Prepare oatmeal or cream of wheat with figs in top of double boiled. Discuss method of cooking overnight, bringing in the advantage of planning one's work ahead, and a food better prepared, than one hurriedly cooked for breakfast.

Where no laboratory work is given, discuss the manufacture of the cereal most commonly used in the neighborhood. An exercise correlated with the agriculture work may be planned. In a one-room rural school, a cereal could be prepared in a large double boiler on the heating stove, and the cereal served for luncheon, the children bringing the milk and sugar from home.

DECEMBER

First Week.

Protein Foods. The word "protein" comes from a Greek word meaning "I take first place." It is food containing nitrogen, and in every growing cell nitrogen must be present. (Correlate with physiology work.) Protein furnishes the material from which the tissues are built or repaired, and is therefore a necessary part of the diet.

Foods having a large percentage of protein are the following: 1, meat; 2, fish; 3, milk; 4, eggs; 5, cheese; 6, legumes; 7, nuts, excluding chestnuts.

It will be noticed that the first five are from the animal kingdom. Protein foods are our most expensive foods, therefore, care should be exercised in their selection, preparation and use.

Milk. The milk which is used in this part of the world is largely cow's milk, but in foreign countries goat's milk as well as ewe's milk is used extensively in the manufacture of cheese. In countries where there are no cows the milk of native animals is used. The value of milk for nourishment is not as well understood as it should be. By many people it is considered a beverage rather than a food. Milk is a complete food, in that it contains all the

food principles. (Review work for September, p. 25), but it is not a *perfect* food because the ingredients are not in proper proportion. The average composition of cow's milk is protein 3.2%; fat 3.9%; sugar 5.1%; mineral matter .7%; water 87.1%.

The proportion of fat found in milk varies with the kind of cows, and often dairymen have in their herds a mixture of breeds of cows. The kind and amount of feed, the age of cow, and the climate also affect the production of milk. (Discuss care of cows and stables, sanitary methods of milking and handling of milk after milking, also care of utensils used in handling milk. Where possible visit a good dairy and creamery.

When milk stands, the fat, which is in small globules, comes to the top, and is known as cream. From cream, butter is manufactured. Skim milk is whole milk from which the fat has been removed. Its value is not sufficiently appreciated, and it should be used for cooking purposes.

Butter Milk, the residue left after removing the fat, is often discarded, but in late years has been considered of great value because it is easily digested and has qualities which destroy disease producing germs in the digestive tract. Among the milk products we have butter, many kinds of cheese, home made and commercial, such as Cream, Edam, Limburger, Neufchatel, etc.

Laboratory Work. Milk being a protein food is coagulated by high temperatures, therefore, in laboratory work, the use of a double boiler is advised.

Many people do not have access to ice or other proper storage. Besides keeping it on ice milk may be preserved for a short time by pasteurization—a process by which the milk is heated from 60° to 65° C. for ten minutes or longer. When properly bottled, keep in cool place and note time milk *keeps*.

Sterilize a bottle of milk by heating to 100 C. and keep there for some time. Note difference in taste of fresh milk, pasteurized and sterilized milk. Note length of time sterilized milk "keeps." Discuss application of methods, and method used in home for keeping milk. Have children make list of dishes prepared at home in which milk is used. Milk should never be left in an open cup, pitcher or crock, because it absorbs flavors readily and is exposed to dirt and dust.

These experiments could be made on a heating stove in any rural school.

Where no laboratory work is given, an inspection trip to a

good dairy, or a trip to a creamery would be beneficial. If such a trip is made it should be carefully planned far in advance so that certain things would be observed and definite results obtained. The results of such an excursion should be written up as a composition lesson.

Second Week.

Discuss the manufacture of cheese, both cottage and commercial products.

Laboratory Work. Cheese is a protein food, therefore must be cooked at a low temperature. Place a piece of cheese in a hot frying pan. Results? Place same sized piece in top of a double boiler. Results? Draw conclusions.

Prepare potato au gratin, using white sauce, No. 2, in which cheese is grated. Why cook cheese this way?

Where no laboratory work is given in rural school the cheese experiment could be made on the heating stove or by using test tubes and an alcohol lamp. Make a list of dishes used in the home that are made with cheese.

Third Week.

We are still studying protein or tissue building and tissue repairing foods. Perhaps no article of diet is more commonly eaten in all countries than eggs. Hen's eggs are most common, although eggs of other fowls such as ducks, geese, turkeys and guineas are used to a greater or less extent.

All are familiar with the appearance of an egg as it comes from the market, or the home. Eggs of birds or fowls vary in color; hen's eggs vary from a pure white to a light or deep brown in tint. Many people believe that dark-shelled eggs are "richer" but investigation have shown that there is no correlation between physical appearance and chemical composition.

Eggs are considered a complete food because they contain all the material necessary for the development of the chick. They contain protein, mineral matter, fat, water, but no carbohydrates. (Review "Definitions in Food Study," pp. 25-27 above.)

The tissue of the chick is composed of essentially the same materials as are the tissues of the human body. The principle tissue building portion of the egg, or protein, is *albumen,* the white of the egg being composed chiefly of albumen and water. So much water is present that one-half of the yolk is water. The yolk contains some albumen, large amounts of fatty substance or oil,

and mineral matter. Since the egg contains no starch or sugar, foods rich in carbohydrates should be served with them.

In selecting eggs, a fresh egg has a shell more or less rough. When held up to a strong light, it should look clear, the yolk being approximately in the center. When dropped in water it quickly sinks to the bottom and should not rattle when shaken.

A stale egg has a smoother shell, is lighter in weight, due to some of the water having evaporated. A very stale egg appears colored when held up to a very strong light. The flavor is affected by age, the white and yolk are more difficult to separate, and are not so light when beaten.

Laboratory Work. Test eggs for freshness by holding up to strong light. If candle can not be used make a funnel of heavy paper and test at window. Weigh a dozen eggs known to be *fresh*, and a dozen packed eggs or eggs known to be stale. Test by water method, using either cold water or a brine made in proportion of 2 ounces of salt to 1 pint of water—a fresh egg sinks *at once* to bottom. State price of eggs per dozen and compare cost of eggs by dozen and by weight. Conclusions? If laboratory funds are sufficient, several dozen of fresh eggs could be procured and packed for future use in the laboratory later. The method most commonly used in the neighborhood should be adopted, or a demonstration using water glass in the proportion of 1 part water glass (sodium silicate) to 10 parts of water. Rain water should be used because nearest pure. The water should be boiled, (why sterilize?) then cooled, water glass added, and eggs put in.

If not laboratory work is given, the egg testing and subject of preservation by storage for home and commercial methods can be taken up.

Fourth Week.

Laboratory Work. The proper method of preparing soft cooked and hard cooked eggs. Like other protein foods, eggs must be cooked at a low temperature, because the albumen coagulates at a high temperature, and thus becomes tough.

In soft-cooked eggs, properly prepared, the white resembles a soft, thick curd, while the yolk is fluid.

To prepare soft-cooked egg. Use a graniteware stewpan. Heat one pint of water to boiling point. Turn the gas off, or if using a coal range remove to back of stove (not to a cold place), drop egg in water, cover closely and allow egg to remain in water for six

minutes. Compare with an egg dropped in boiling water and kept at that temperature for 3 minutes. Write conclusions.

To prepare hard cooked egg. Place egg in boiling water, keep at a temperature of 180°-190° F. for 35 to 45 minutes, either by double boiler method or by placing on back of stove. Keep vessel covered closely. A hard-cooked egg is the result, with yolk dry and mealy and the white solid, yet tender. Compare with an egg kept at boiling point for ten minutes.

Plan a breakfast in which soft or hard-cooked eggs are used. If time permits prepare scrambled eggs in top of double boiler and compare with eggs scrambled over direct heat in frying pan. Have children make list of dishes in which eggs are used. Discuss different foods which should be used with eggs.

If no laboratory work is given, the illustration of soft- and hard-cooked eggs could be made by using an alcohol lamp or on the schoolroom heating stove. If work in "foods" only is being done, the composition and use in diet, along with the selection and care of eggs for market may be discussed.

JANUARY

First Week. Protein Foods Continued.

Meat: Protein foods are our most expensive foods, therefore, great care should be exercised in their selection, preparation and use. More money is spent for meat in many families, than for any other article of food. This may be due to the buying of expensive cuts, or to improper methods of preparation, or because of a lack of knowledge as to meat substitutes such as cheese, eggs, beans, etc. (Review list of protein foods.) We have seen that cheese and eggs are made tough by being cooked at too high temperature, and meat being a protein food, is often toughened from the same cause. However, meat may be tough before cooking, the age of the animal, the food eaten, and the amount of exercise all affecting the meat. The muscles of the body that are unused are soft and flabby, while those that are much exercised are firm and tough.

If a piece of meat were examined under a microscope, it would be found to be made up of small fibers which can be separated from one another. In tender meat, the fibers seem to be more easily separated. A cross section of the fiber would show it to be a tube, the outside being connective tissue. This connective tissue holds some water in which are partially dissolved protein,

coloring matter, and extractives which give flavor to the meat. The bundles of fibers are made up of these individual fibers held together by connective tissue. The more the muscle is exercised, the tougher and thicker the meat. (Farmer's Bulletin No. 34—Meats, Composition and Cooking.) This bulletin has illustrations showing tough and tender cuts. Discuss different cuts, as to price and reasons for toughness. Correlate with study of muscles in physiology.

Laboratory Work. Take up the study of beef: Use a piece of round for lesson, to bring out structure. Separate the fibers as much as possible and examine the shape and size of muscle tubes. Notice how the fat is placed. After examination take a small piece of meat, and with a dull knife scrape, thus obtaining a mass of red pulp and tough white materials. The red pulp is the contents of the muscle tube, while the white mass is connective tissue. Compare the two masses. Cook a ball of the red pulp in a hot frying pan. Cook some of the connective tissue in hard boiling water for ten minutes. Cook some of the red pulp and connective tissue at simmering point for half hour. Compare and discuss finished products. Do not fail to point out the proper method with *reasons* for same.

Where no laboratory work is given an interesting lesson on the meat packing industry would be instructive since it is the largest manufacturing industry in the United States, the value of the product in one year being $1,370,568,000. Correlate with geography.

Second Week.

Beef: If possible at this time a trip to a local butcher shop where the carcass can be seen as a whole, and a demonstration showing from what part of the animal our retail cuts are obtained, would be most profitable. In many of our communities, a "Meat Ring" is in existence—a number of people in the community go together and butcher a beef. If possible, arrange to have the class attend the cutting up of carcass.

Much thought is given to the feeding and care of market beef. Good beef should be firm, fine grained, bright rather than dark red in color, and well mottled with fat. In buying meats one will find that the cheaper cuts, when properly prepared, are just as palatable and contain as much food value as the more expensive cuts. The retail prices vary widely, depending upon the market price of live cattle. Always in buying any cut of beef, the bone,

skin and rough trimmings, also the excess fat must be considered as non-edible. For example, if a steak costs 20c per pound, 80% of which was lean, 10% fat, and 10% bone, how much was the net cost per pound?

Laboratory Work: This lesson can either be conducted in groups or used as a demonstration. Use a piece of chuck or neck, because they are cheap cuts; wipe with a damp cloth. Cut into pieces about 2" x 4", either sear in hot fat, to keep the juices in, or plunge in boiling water for same purpose. Season and simmer (why?) until tender. The broth is called "stock", which may be thickened and used as soup, or diced vegetables such as onions, carrots, and potatoes may be cooked in it and a vegetable soup made. Why use these vegetables with meat? Why cook in same stock? (Review work for October, "Carbohydrates", pp. 26-29 above.)

Where no laboratory work is given, a free-hand chart should be made showing the location of cuts of beef, indicating local or market prices, etc., ascertained by the pupils. Give problems in percentage of edible and non-edible portions of beef—figuring in live weight, hide and weight of dressed carcass.

Third Week.

Beef: The extractives give to beef its flavor. In a piece of soup meat, we aim to draw out these extractives which give to the stock its "good taste". When these are removed, the food value of the meat is quite as good as before removal. Many people do not understand this, and waste the meat, whereas, by the addition of a highly flavored food, a palatable and nutritious dish may be prepared. Many left-overs, however, take more time to prepare and cost more than the original dish. Therefore in making a soup, plan to use the meat for croquettes, a good hash, a creamed meat with toast, or meat prepared in casserole. Adapt the lesson to the needs of the community.

Laboratory Work: Soup.—A piece of shank, neck or chuck should be used for lesson. After wiping with cloth to remove dirt and dust and marks of careless handling, place in cold water and bring to simmering point. By placing in cold water the extractives are drawn out. Soup meat needs to be cooked a long time, because the cuts come from portions of the animal exercised a great deal, and are therefore very tough. When the meat is tender, remove from broth. If a vegetable soup is desired, cut vegetables

in dices. Cook until tender. Rice and barley are often added. Why use these with meat stock?

If too long a period is to elapse before the next laboratory period for the boiled meat to keep, the instructor should prepare a left-over meat dish, showing how it can be used to good advantage.

Soup of this kind could be prepared on the heating stove and served at noon lunch when no laboratory equipment is available.

Fourth Week.

This week we will take up the study of pork—or the flesh of swine. The meat is not so highly colored as beef, should be firm and fine grained. The fat varies and should show no softness, though it is less hard than the fat or "suet" of beef.

The method of cutting up a side of pork differs from that employed with other meats. This furnishes the cuts which are used for "salt pork" and bacon. A chart showing the relative position of cuts of pork, should be used, and discussed. Also the home methods of preservation and curing bacon, hams and shoulders, along with the home methods of rendering and storing of lard, dwelling upon sanitation as well as preservation would be helpful and interesting.

Laboratory Work: To Prepare Breakfast Bacon.—Breakfast bacon is probably the most popular kind of meat used for breakfast. It is easily digested, because of the granular form of its fat. No other kind of meat is probably so poorly cooked. The slices should be of medium length and thickness, should be cooked in a frying pan until crisp and brown, then drain on paper (not newspaper—why?) so that there will not be surplus fat on platter. The drippings thus obtained can and should be saved for use.

If time permits pork chops should be prepared. Roll in eggs and bread crumbs and fry in deep fat, or sauté, which is a more common method of preparing pork chops in the home. In sautéing, use a little fat in skillet or frying pan. Roll chops in flour and corn meal (why?) and place in frying pan, which is hot and has a little hot fat in it. Cook until *thoroughly* done.

Where no laboratory work is given, it would be interesting to correlate the work with geography. With the development of railroad transportation, and the westward extension of the corn belt, the pork producing and packing industry has greatly increased. The introduction of the refrigerator cars, and cold storage has aided the exports, and this too could be taken up in detail.

An estimate of cost and amount of pork consumed in a certain number of families in the community, could be correlated with the work in mathematics.

FEBRUARY

First Week.

Wheat is the typical bread making grain and the one most used for human food in the United States. Wheat is usually classified as "soft" or "hard" according to spring or winter wheat. Winter wheat is sown in the fall, where the winters are not too severe and matures in the early summer. It contains more starch and is a softer wheat than the Spring wheat, therefore it is known as "soft" wheat. (Correlate with Agricultural work.) If possible bring into the schoolroom a sample of winter wheat and compare with a sample of hard wheat, which can usually be obtained at the flour mills.

Spring wheat is grown mainly in the North-Western States, in the Dakatos and Canada. This wheat is sown in the spring and harvested in the late summer. It is harder than the winter wheat, contains less starch, but more gluten than the winter wheat. This "gluten" is the protein or mixture of protein found in wheat. Review work for October, pp. 27-28 above.) Use of protein to body—why necessary, list of protein foods, etc. This gluten when mixed with water becomes viscid or stieky, and later in our bread making lesson we shall see why it is necessary to have this gluten present when using yeast.

In making edible foods from the cereals, various methods for grinding the grain have been in use from the earliest times. In primitive times the methods were crude and imperfect, two stones being used to crush the grain used as flour. Later the water power mills were built. Now we have a very thorough process in which the wheat is first screened and cleaned; second, passed between corrugated rollers, the kernels partially flattened and slightly crushed, called the first brake. A small amount of flour is separated from the crushed kernels by sieves. The wheat is next passed through the second brake. The kernels are more completely flattened and meal-like flour particles partially separate from the bran. The products of the second brake are called first and second middlings and look like Cream of Wheat. The middlings pass over rolls more closely set, the product becoming finer and the bran particles being gradually removed. At last the flour is passed through fine bolting cloth and the last and finest product is known as "patent

flour." The flour containing the middlings or bran particles is a low grade of flour.

Besides the white flour we have Graham flour, in which the entire grain is ground without sifting.

Whole wheat flour does not contain all of the kernel, a part of the bran being removed. It is often the case that a low grade of flour becomes rancid because of the fat and can not be kept for any length of time.

Only flours from wheat and rye are used in making yeast bread.

Laboratory Work: Experiment to be performed by instructor. Moisten equal measures of hard and soft wheat flour with enough water to make a stiff dough. Knead well and set aside for ten minutes. Work gently in a bowl of cold water or under running water until all the starch is out. Starch is not soluble in cold water. How can you tell when it is all out? Which contains more starch, the dough from the soft or hard wheat? Notice color and consistency of what remains. This is the protein of the flour called gluten. If possible have bread flour, Graham and whole wheat flour. Compare and discuss. Have children write a description of each, pointing out the difference in manufacturing process in their note books. Also have them make a list of the brands of flours used in community.

Where no laboratory work is given, trace the wheat states on the map, noting production of wheat in different states. Name cities in which largest milling industries are found. If possible secure a booklet on flour from some milling firm and let children read and discuss it. Perform experiment to determine whether flour contains starch or gluten.

Second Week.

In order to make flour palatable as food, it must be cooked in some way. *Ship biscuit is* probably the simplest method of preparing flour for food. Flour and water are mixed together and baked—the product being almost of gritty hardness. Hence the problem arose, how to cook the flour that it might be palatable and more easily digested. The problem was solved by causing gas to develop in the mixture of flour and water. This may be produced by the introduction of baking powder, soda, or yeast.

In baking powders are various chemical substances, which have this in common, that when moistened and heated, the ingredients of the powder act upon one another, forming a gas which causes the mixture to rise. Discuss different brands of baking powder.

Read labels, discuss cost per pound and amount used in different recipes. Explain why it is possible to prepare baking powder biscuit in morning for noon meal, if biscuits are kept in cool place. Bring out fact that "self-rising" flour is a flour with which baking powder has already been mixed.

Laboratory Work: Baking Powder Biscuit.—In measuring flour, fill the cup with spoon, rather than dipping cup into flour. Why? Weigh cup of flour which was dipped out and one in which flour was put in by spoon. Results? Weigh cup of sifted flour and one of unsifted. Results? Which is the better method of measuring? Give recipe. Call attention to proportions of flour, baking powder and shortening. Biscuit should not be too thick or too large, why? When done they should be a light golden brown, both top and bottom. The texture should be fine and even. Have girls serve one another for the practice. Urge girls to bake biscuit at home and report results.

Where no laboratory work is possible directions for making biscuit should be explained and work done at home and some credit given for this home work.

Third Week.

In making yeast bread there are three essential ingredients necessary, namely: flour, liquid and yeast. The nonessentials are shortening, sugar and salt. Yeast is a plant and requires proper food in the form of (1) carbohydrates which is obtained from the flour; (2) proper temperature, 30°-32° C. or 70°-72° F.; (3) moisture in the form of liquid which may be milk, either sweet, sour, buttermilk, or water. We have different kinds of yeast, namely: *Compressed, Dry yeast or yeast foam, Liquid or jug yeast.*

The compressed yeast is a byproduct of the brewing industry. The healthy plants are kept at a temperature so low that they do not grow. The yeast cakes are put up in a sanitary tin foil wrapper, and if kept at a low temperature, can be kept for several days.

The dry yeast is made of dormant plants distributed through a corn meal mixture and dried in the oven. If not too old or dried at too high a temperature, it is a very satisfactory yeast.

Liquid yeast or "jug yeast" is kept from one baking to the next. If kept at a warm temperature the plant has food, moisture and temperature and may grow before using in the bread, therefore it should be kept at a cool temperature until desired for breadmaking.

For the quick process of bread making the compressed yeast is the most satisfactory. From $\frac{1}{4}$ to 4 cakes per loaf can be used,

according to the time allowed. If necessary to make bread during 2 hours laboratory period two cakes per half size loaf should be used.

Clean utensils are also essential, a bread board, crock or mixing bowl with bits of left over dough may be the cause of bread not being good—the bread will have a bad flavor or be sour. This is caused by foreign bacteria which have lodged on the bits of dough and grown, forming bad flavors. Therefore scrupulously clean utensils are necessary. In cold weather the utensils and flour should be warmed before the yeast is added, in order that an even temperature, 30°-32° C. or 70°-72° F., be maintained. Earthenware mixing bowls are best, because they retain the heat longer and do not absorb moisture as the wooden ones do.

The mixing and kneading of the dough has much to do with the quality of the bread. We mix and knead bread first to distribute the yeast plants through the dough. Second the oxygen from the air is added, and oxygen is essential to the growth of the yeast plant, therefore thorough kneading is necessary. As the yeast plant grows, it gives off carbon dioxide gas which enters the gluten particles of the flour, expands them, thus causing the dough to rise. Bread must be watched, because when the plant growth is continued at too great length, the yeast plant is killed, and undesirable flavors develop.

In order that the pupils may see and understand the importance of correct temperature, the following demonstrations might be given by the instructor. Place in three glasses or beakers, $\frac{1}{2}$ cake compressed yeast, over the first pour boiling water, the second ice water or very cold water, and the third water at 32° C. or 72° F. When dissolved mix the first in a batter made of flour and boiling water. Mix a batter of ice water and flour for the second. For the third make a batter that is the right temperature for growth of yeast. Keep these batters at corresponding temperatures. The yeast plants in the first were killed by the heat. A cold temperature retards the growth of the yeast plant, therefore if the second mixture were removed to a warm place and left several hours the dough would become light. The third mixture being the proper temperature will rise. This will bring out clearly the fact that heat or cold have bad effects upon the yeast plant.

There are two processes of making bread:

(1) The Quick Rising Process, by which a stiff dough is made and a considerable amount of yeast added. The dough is allowed

to rise until about twice its bulk. A good test is that of plunging into the dough a silver knife. When it is withdrawn, if the dough sinks then it is light enough. It should then be thoroughly kneaded and should have a smooth appearance and a satiny gloss on the surface when finished. Next it should be made into loaves, allowed to rise until almost double the original bulk and then baked. During this entire process an even temperature—30°-32° C. or 70°-72° F.—must be maintained. If temperature is too low, set the crock in a pan of warm water, but *keep at an even temperature.* The bowl containing the dough should be covered with a plate or lid. It is more sanitary than covering with a cloth and a hard crust over the top is thus avoided.

(2) The Slow Rising Process is that in which a sponge is made and allowed to rise before the stiff dough is mixed. This is the process most commonly employed when liquid or jug yeast is used.

Bread should always be baked in single loaves, and baked for 45 minutes to an hour for ordinary sized loaves. If more than one loaf is baked in a pan the side loaves will be done before the center loaf is thoroughly baked. The brown crust formed on bread is due to the starch of the flour being changed to sugar and chemical changes known as "caramelization" change the color. This is easily digested and explains the reason for using toast instead of bread when the diet must be carefully arranged. The brown crust should not form within the first twenty-five minutes, and the bread should be turned several times during this period, so that if the oven is not of even temperature, the loaf will not be one-sided, but a well shaped loaf.

When thoroughly done, the bread should be cooled by placing the loaf on a bread rack or against the edge of the pan in such a way that no side of the loaf touches any surface, thus allowing a free circulation of air. Wrapping bread in a cloth during the cooling causes the crust to be steamed and to become moist and sticky.

Following is the individual recipe and directions for making bread by Quick Rising Process.

1 cup liquid—milk or water (milk better because of food value).
2 cakes of compressed yeast.
1 tsp. salt.
2 Tbsp. sugar.
1 Tbsp. shortening (lard).

Place the sugar, salt and lard in mixing bowl. Place the yeast in small amount of warm water to soften. Heat milk to scalding

point in top of double boiler. Why? Pour over ingredients in mixing bowl. Allow to cool until 32° C. or 72° F. When proper temperature add the dissolved yeast. Add the flour a little at a time, mixing thoroughly. When stiff enough to handle, turn on dough board and knead until it does not stick to the fingers, is smooth and has a satin gloss. Clean mixing bowl, grease, place dough in it, cover with plate or lid—why? Let rise until about twice the bulk then knead thoroughly, make into loaf and place in greased pan. Let rise until almost twice its size and bake for 45 minutes.

If a score card is desired, one can be obtained from the Extension Department of Purdue University. Be sure and use the flour used in community in order that the girl be successful in her home work.

Where no laboratory work is given, directions should be given and the bread baked at home and the loaf brought to school to be scored.

Fourth Week.

Bread is the staff of life. Probably no other food is so commonly used in the American home. A review of last week's work would be most profitable. A discussion of methods of storing flour in the home, bringing out the points that it should be kept in a light, clean, well aired place in preference to a dark, damp, mouldy cellar. Why? Discuss tests for a good flour.

Laboratory Work: Bread should be baked again this week. Use method most common in community. Bring out the main points to be observed in bread making, namely:

1. Good ingredients.
2. Proper utensils.
3. Well mixed and kneaded dough.
4. Correct temperature for rising.
5. Thorough baking.
6. Proper keeping.

Where no laboratory work is given, urge the girls to bake bread at home, have an exhibit and score the bread, using Score Card.

MARCH

First Week.

This month we are taking up the subject of cakes, puddings and pastry. In cakes, either loaf, layer or small cakes and cookies,

certain relative proportions are to be followed. There is less butter than sugar, and less sugar than flour. Less baking powder is required with a given measure of flour than would be necessary for a dough without eggs. A teaspoonful of baking powder for each cup of flour (even measures each) is ample, where several eggs are used. An excess of baking powder is apt to make the cake coarse grained. The cake will also dry out more quickly, and the flavor is not so pleasing. A change in proportions of materials often leads to changes in the manner of mixing them. For instance where a small amount of shortening is used, it may be melted and beaten in, but where a larger amount is required, the better plan is to cream the butter or shortening, blend the sugar, then add other ingredients, folding in the egg whites last if whites only are used. If whites are *stirred* in, the cells which hold the air are broken and the air which was incorporated during the beating, escapes, and the mixture is not so light.

Layer cakes require less flour than large loaf cakes. This is due to the fact that the small cake is stiffened quicker by the heat.

Laboratory Exercises. Bake a loaf cake, ½ recipe for two girls. Use whole egg, or if white cake preferred, use yolk for custard, salad dressing or omelet, demonstrating the use of left-overs. Test oven by placing manilla paper in oven. If it browns within ten minutes the oven is of a proper temperature. A loaf cake requires a slower oven than does layer cake. Have half of the class use water instead of milk. Compare as to flavor and texture. *Conclusions?*

Where no laboratory work is given, discuss cake baking with class. Have them bring tried recipes from home. If possible have each girl bake a loaf cake, and bring a portion of same to school. Discuss method of procedure, cost (correlate with arithmetic) and number of servings as well as different food nutrients in cake.

Second Week.

Small Cakes and Cookies. Small cakes are cakes baked in small cake tins or individual pans, or dropped from spoon. The dough if baked in tins should be about the consistency of that in layer cakes. If dropped from a spoon, a stiffer dough than that in a layer cake is necessary. Dough for cookies should be stiff enough to handle easily on bread board, should be kneaded very lightly, rolled and cookie cutter used.

Laboratory Exercises. Make Drop Cakes. How many mixing and baking utensils are necessary for doing work in a satisfactory

way? The cakes can be varied by the use of spices, nuts or raisins.

Have children bring different recipes from home and while cakes are baking, discuss the recipes and relative cost, also number each recipe makes.

Where no laboratory work is given, make a collection of the different recipes brought from home and where possible, give directions, and have girls bake cakes and bring to school for comparison of flavor and texture. Discuss method of procedure.

Third Week.

Desserts are considered a necessity in the American home, and puddings of various kinds are extensively used. In planning a meal thought should be given to the kind of dessert to be served. If the meal has been heavy in food nutrients (review work on Classification of Foods, pp. 27-28 above) then a simple dessert such as fruit or gelatin puddings should be served. Where the first part of the meal does not furnish much food value a "heavy" dessert such as suet pudding, rice, tapioca or cottage pudding should be served. (Discuss relative value of puddings named.)

Laboratory Work. Have a portion of class make bread pudding. One section rice pudding. Another tapioca. Exchange recipes, and urge each girl to make the various kinds at home, and report on same. Discuss food value of above puddings and proper place in menu.

Where no laboratory work is given a discussion of food nutrients as to place in diet, cost of materials, amount of time used in preparation. Have different recipes tried out at home, according to directions given in class.

Fourth Week.

Pastry. "Pastry is a stiff dough with a large proportion of shortening. It is flaky when baked rather than porous. Pastry and pies should not be used as a staple food, but when well made and properly masticated, pies may be eaten occasionally by people in good health. The crust should be flaky, and thoroughly baked."

The ordinary classification of pastry is: (1) *Plain pastry*, in which the shortening is blended into the flour by chopping or with the finger tips, a pinch of salt and enough water to moisten. In making pastry the flour, shortening and water should be thoroughly chilled before mixing and the ingredient handled very lightly and quickly, as too much handling toughens the dough. Lard

makes more tender crust but lacks the flavor which butter gives. (2) *Puff paste,* which may seem difficult to prepare, is made by blending flour, shortening, salt and water in the usual way, then carefully rolling and folding, introducing thin strips of butter during the process. The lightness and flakiness of puff paste depends almost entirely upon the handling and the amount of air incorporated by successive rolling and folding.

Laboratory Work. Have one section of class make custard pie and the other section make cherry pie. Have girls copy both recipes. Give recipes for two kinds of crust, and urge girls to try first at home.

Where no laboratory work is given, discuss recipes brought from home. Urge girls to bake pies according to directions, and bring to school if possible.

APRIL

First Week.

Frozen Mixtures: This week we will finish our lessons on desserts. The time has been too short, but each lesson has brought out a different principle, and it is hoped the girls will put into practice in their homes all underlying principles brought out in the laboratory.

In a freezing mixture, the freezing is accomplished by using a mixture of chopped ice and rock or coarse salt. The proportion of ice to salt depends upon the texture desired. Three parts of ice to one of salt, is the proportion most commonly used with the slower freezing process. In freezing creams and sherbets, which are to be firm, velvety and fine grained, this proportion is most satisfactory. In "frappes" and "granites" (course grained, granular mixtures,) two measures of salt to one of ice is most satisfactory. In either case the ice should be thoroughly crushed, before attempting to measure. A good method for cracking ice is that of placing ice in a heavy canvas bag and crushing with a wooden block or mallet.

Laboratory Work: Have one section of class use the 3:1 proportion and make a vanilla ice cream. The other section the 2:1 for preparing an orange "frappe". Two girls working together, using double boiler set in dish pan or bowl full of ice for freezing. Compare products as to texture and bulk and time required for freezing respective mixtures.

Where no laboratory work is given, a discussion of home and commercial methods of making ice cream, the relative cost, texture

and flavor would be beneficial. Compare the number of servings and respective cost of brick ice cream and that obtained in bulk.

Second Week.

Planning Meals: In preparing a number of dishes for a meal more skill is required, than in the making of a single dish. With limited knowledge of food values, it is a hard proposition for a student doing elementary work, to plan a well balanced meal. Each meal must contain all of the five food nutrients, namely, *protein* for the building and repairing of tissue, *carbohydrates* for energy, *fats* for heat, *mineral matter* for building bony tissue, and *water* because it enters into the composition of every tissue in the body and forms more than 60% of the entire body weight. (Correlate with work in physiology and discuss various uses of water.) (Review work on Food Nutrients and classification of food, pp. 26-30 above.)

Different factors such as age, climate and occupation must be considered. A growing child needs more tissue building food than does an older person. In a warm climate less heat producing food is needed than in a cold climate. A person performing hard muscular work requires more protein, because more tissue needs to be repaired; and more energy producing food is required than for a person living a less active life. With these facts in view have each girl bring to laboratory, a menu for a breakfast for family of six. Man at moderate muscular work, woman, two girls and two boys, all four growing children. Discuss different food nutrients and preparation of each.

Laboratory Work: In preparing any meal no matter how simple or elaborate, certain points should be considered. Namely:

1. What preparation of food can be made ahead of time, such as washing, paring, cutting, etc.

2. What things take the longest to cook, and which ones must be served as soon as they are done.

3. Which dishes can be kept hot for some time, and which ones finished and cooled for several hours before. After the menu is decided upon, make a plan for preparing it. The following menu is offered as a suggestion for breakfast.

Oatmeal. (Cook in double boiler. Why? Classify.)
Bacon (Well browned and crisp—drain on paper. Why?)
Eggs—Soft cooked. (Classify as to food value.)
Toast and Butter. (Classify as to food value.)
Coffee.

Coffee is not a food but a beverage. It is so commonly used in the American home, that full directions for preparing it should be given. A tablespoonful to the cup should be used. Coffee should not be saved from meal to meal. The coffee pot should be thoroughly washed each time it is used; occasionally clean with a little soda added to water and allow to boil in the pot for several minutes. Rinse thoroughly.

Discuss skeleton menus prepared by pupils.

Discuss methods of preparation and serving.

Where no laboratory work is given the skeleton menus can be made, discussed as to food nutrients; manner of serving meals in home, and suggestions for serving; suggesting ways of saving steps, removing soiled dishes.

Third Week.

The lesson this week will be on table equipment and service only. The family table is a place where beauty should play a prominent role. Most people understand the charm of an attractively laid table. We must remember that many people in our country live in crowded quarters and have time only for the simplest kind of table service. Therefore, if there is no laboratory equipment, make the best of available materials. Use the supply table if necessary. Where linens are not owned by the department, supply a lunch cloth, paper doilies or even a nice clean towel. Have something for a center piece—vines grown in the school room or any early blossoms—just a few to make an attractive table. Use paper napkins. They are sanitary, save laundry and are very cheap—fifty for five cents. These are all items worth considering by the busy housewife.

Use the school silver or steel knives and forks and the dishes, no matter how plain and simple—a good chance to teach dignity along with simplicity. Be just as particular about the setting of the table as though the best of silver and china were used. Have everything clean and shining. Have as little on the table as possible. Time will not permit the preparation of a meal; however, the menus prepared by the girls can be discussed, a good menu suggested, and a few of the things prepared and served. Have certain girls for guests, others to serve, thus combining a lesson in setting the table, serving and in some of the so-called "niceties" in table etiquette.

Where no laboratory work is given, discuss table equipment, namely: table linens, cost and methods of laundering the same; se-

lection of dishes, glassware and silver for table. If some one in the neighborhood would offer the use of a dining room and dishes, a table setting demonstration would be very beneficial.

Fourth Week.

Plan a reception for the parents and friends of the school. There should be a talk by the instructor on the work covered during the year, a simple demonstration by two of the girls, such as preparing White Sauce or soft and hard cooked eggs. One or two girls should be doing the work while another might give the *reasons* for methods used.

An exhibit of the sewing, neatly pressed and mounted, along with all note books prepared during the year, should be made at this time.

Light refreshments, such as punch and wafers or small cakes, could be made and served by the girls—glasses and plates being brought from the respective homes, if necessary.

6. Lessons in Sewing and the Study of Textiles

a. EQUIPMENT NEEDED IN THE RURAL SCHOOL

A study of clothing and practice work in sewing may be undertaken where the teacher is qualified to give instruction and where there is opportunity for the class work. The necessary equipment for this work in sewing in a rural school may be purchased for about $8.25—as follows:

1. A board top kitchen table.....$1.25
2. Cupboard spaee to keep the pupil's work is necessary. Shelves and pasteboard boxes may serve the purpose, but it would be better to build a case for the books and materials used.
3. Each girl should furnish scissors, a thimble, a paper of needles (6 to 10) and a private sewing bag.
4. The books and bulletins listed in Section D, 1-b of this course of study may be purchased for $7.00.

For advanced work in sewing, machines should be provided. The making of garments by hand is not teaching the girls to do the work in the proper way. The teacher should direct the pupils in selecting the materials and equipment they furnish. Cheap grades of material and equipment should be avoided. It is always economy in the end to select good materials.

b. EQUIPMENT NEEDED IN THE CITY SCHOOL

For official list of equipment for sewing work in the grades of city schools, see Section D, p. 110, below.

c. LESSONS IN SEWING OUTLINED BY MONTHS AND WEEKS

SEPTEMBER

First Week.

The Workbasket and Its Equipment: A workbasket or box is much better to use than a work bag, because it is easier to keep the sewing implements and sewing materials in order. The articles needed in a sewing basket are scissors, or shears, thimble, needles, thread, emory bag, tapeline and pincushion. In buying these it is always economy to buy good grade articles. Scissors are never more than six inches in length, if longer they are called shears. Scissors or shears should be made of forged steel. The screw which holds the two blades together should not be too tight. There are

both straight and bent shears. Bent shears have the handle bent in such a way that in cutting the shears can slide along on the cutting table, thus making the cloth stay flatter on the table. Cheap scissors or shears should not be purchased because they will not cut a true edge. Scissors or shears should never be dropped, as it is apt to dull the points and spring the screw so that they will not cut well.

A thimble should fit the finger of the person wearing it. If too tight it pinches and when too large falls off easily. Never use brass thimbles, as they may poison the finger if there are any scratches or bruises. Thimbles are made of precious stones, gold, silver, glass, aluminum and brass. Aluminum thimbles are good and very inexpensive.

Needles used for plain sewing are of three kinds, i. e., *Sharps,* a long needle; *Betweens,* a very short needle, and *Grounddowns,* a needle of medium length. Needles range in size from 1 to 12, the latter being the finest. There are twenty-five needles in a package. There are packages which contain needles of different sizes and there are others which contain needles of all one size. The latter is the best kind of package to buy. For school use a package of No. 8 and a package of No. 10 will be found to be of most use. Betweens are better than Sharps for beginners because they do not bend so easily. Needles should be polished with the emory whenever sticky and should be kept in a pincushion or needlebook when not used.

The laboratory work this week should teach the proper methods for using the thimble, needle, etc. Never bite or break thread—always cut it. Insist that the child use a thimble in sewing. The proper position while sewing is back straight and against the chair and feet flat on the floor or crossed easily.

The beginning work should consist of making basting and running stitches on checked ginghams. Use French gingham. Checks are used because they produce a means of guidance for the work, giving the child time to devote all its efforts to pushing the needle through with a thimble. When a man is teaching the work, and it does not seem practical to do the actual sewing, the laboratory time could be spent in making a booklet on the "Sewing Basket."

Second Week.

The Sewing Basket Equipment: Thread is a strand made of cotton, wool, linen or silk. Cotton and silk thread are most commonly used. Thread made from wool is called yarn. Cotton

thread is numbered from 8 to 200, after No. 10, skipping ten each time until No. 100 is reached, when fifty is usually skipped each time. Silk thread is numbered with letters, A, B, C, D, O, OO. When thread was first made it was a coarse, uneven and loosely twisted strand. It was sold on bobbins and when this wooden spool or bobbin was empty it was returned to be refilled. When the sewing machine was invented it was necessary to have better thread. Clarke put a thread on the market called Clarke's O. N. T. and these letters stood for Our New Thread. Today cotton thread comes on spools each containing two hundred and fifty yards and costing five cents. Cotton thread is made in black and white and many colors. In selecting thread choose the thread that is the nearest in size to the thread in the material upon which it is to be used. Select a needle just large enough to carry the thread. Coarse thread when used on fine cloth will wear out the thread of the material. After thread is used it should always have its end slipped in the slit in the spool edge so that it will not become tangled in the basket.

The laboratory work this week should consist in making a stove holder of cheesecloth lined with cotton sheeting and quilted, using the basting and running stitches learned last week.

Where the sewing work is not taught in the laboratory, the Sewing Basket booklet may be finished.

Third Week.

Textiles: A textile is a material capable of being woven. The term textiles, however, includes all knitted and crocheted materials, felts, bark cloth, etc. The value in studying textiles is to be able to determine a good piece of material from a poor one, to identify materials and to know widths, prices and uses of different materials.

A textile material is made of two sets of thread—those running lengthwise of the cloth, called the warp threads and those running crosswise, the woof threads. The warp threads are the strongest threads. The finished edge of a material is called the selvedge. The machine upon which textile materials are made is called a loom. There are many different kinds of looms, each used for a different purpose. Textile materials are made principally from four kinds of fibers, i. e., cotton, linen, wool and silk. The first two come from the vegetable kingdom and the last two from the animal kingdom. As any one of the four comes to the manufacturer in its natural state it is known as fiber. Thread or yarn, as it is usually called by the manufacturer, is made up of a great

number of fibers twisted together. Linen materials were made long before cotton ones, but now we have more cotton materials on the market. Silk is the most expensive fiber the manufacturer has to buy. Cotton is the cheapest. *Examine a piece of material to determine the difference in size of warp and woof threads. Determine which is strongest by breaking them. Examine the selvedge.*

The laboratory work this week should consist of learning to hem, using a colored thread on checked gingham. If there is time left, a bag made of gingham may be begun. Use checked gingham and hem the sides, overhanding the two hems together to form the bag. Use the running stitch in making the casing. Draw up the bag with tapes. This bag will need another period in which to be finished.

Where no laboratory work can be done it would prove interesting if the girls would collect samples of as many kinds of gingham as could be gotten at home, learning the names and prices paid for the material. Examine the materials to see the weave and the size of the thread. If a large enough piece of a cheap gingham (at least a yard) can be obtained, wash the material to determine how much it shrinks. All loosely woven materials shrink much more than closely woven ones. A booklet on gingham may be commenced.

Fourth Week.

Textile Fibers: There are certain characteristics of textile fibers that make one easily distinguishable from another. Cotton is a short fiber, being $\frac{3}{4}$ inch to 2 inches in length. It is a flat fiber with a spiral twist. It is not very elastic. Cotton is usually creamy-white in color, but sometimes is quite yellow. Cotton does not take dye-stuffs readily. Cotton is fuzzy on the surface. The cotton boll as it bursts on the cotton plant contains the fibers attached to the seeds, and the process of separating the seeds from the cotton was a very slow, tedious process until Eli Whitney invented the cotton-gin. The United States now produces three-fourths of the world's supply of cotton.

Linen fiber comes from flax and is the fiber obtained from the stem of the plant. The fiber varies from 2 inches to 20 inches in length. It is very strong, but has little elasticity. Luster is a much-prized quality in linen. Under the microscope the fibers appear as made of long cells with the joinings showing very distinctly. In the United States little flax is raised for fiber, but it is cultivated for the seed.

Wool fiber is very kinky and very elastic. When examined un-

der the microscope it is found to be covered with minute scales. These scales are very valuable in the manufacture of cloth as they give the fibers the property of holding together in making yarn. When the fibers are moist and warm these scales open up like a dry pine-cone and when cold and dry close tightly together. The kind of wool produced depends entirely on the breed of sheep and the care with which the sheep have been raised.

Silk is obtained from the cocoon of the silkworm. Silk fiber is very long. It may be three to four thousand feet in length. Under the microscope it appears as a long, structureless mass. It is very strong and also elastic. As it comes from the cocoon it is covered with a gummy substance that has to be removed before it is used. Practically no silk is produced in this country because the mulberry trees upon which the worms feed do not grow well.

If possible the four fibers should be examined under a microscope and a drawing made of each. If no microscope is present make a drawing of each on the board.

The laboratory work in sewing should consist in finishing the bag from last week.

Where laboratory work is not done samples of materials may be examined, the yarn pulled apart and examined to determine the difference in the fibers. Break the fibers to determine which is the strongest. Dip linen and cotton threads into red ink and see which absorbs the ink the more readily. Examine the appearance of the end of a broken linen thread as compared with cotton. The students will be greatly interested in this if they are allowed to hunt for samples at home and asked to bring them to school for class use.

OCTOBER

First Week.

Spinning. Spinning is a process whereby fibers are combined in such a manner that they produce a continuous thread. Just when spinning was first done is not known. "The simplest method of making a thread was to draw out from a clump of wool or other material a small amount of fiber, twisting it as it is drawn. This thread was then wound on a stone or stick which was called a spindle." Later the thread was attached to a hook in the end of the spindle and the spindle dropped. As the woman twisted the thread she allowed the spindle to revolve. Later it was found that a full spindle revolved better than an empty one, so a disk of clay or wood was attached to the spindle and called a whorl. The next

invention was a distaff, which was a device to hold the unspun fibers. This distaff was stuck into the belt or held under the arm in such a way that the woman had both hands free to manage the thread. Not for several hundred years was the spinning-wheel invented. If a spinning wheel is available in the neighborhood it would make the work more interesting to actually show how this was used. A picture would help to make the work plain. In the early days linen and wool were the fibers spun. Cotton is much more difficult to spin by hand. Often the wool and linen fibers were grown, spun and woven by the same household. After the yarn was spun it was wound on wooden sticks or pegs called reels.

Have the girls hunt at home for all the materials that have been made by hand, such as coverlets, linen sheeting, etc. If they can find someone who knows about spinning by hand it will prove interesting to the rest of the class to hear a description of the work. A girl will be much more appreciative of materials if she is taught something of the history of their manufacture.

The laboratory work in sewing should consist in making a model in canvas showing the method of hem-stitching. A towel should then be made and hemstitched at each end. Huckabac guest toweling is best to use for this—use $\frac{3}{4}$ yard for each towel.

Where there is no laboratory work to be done each girl might make a collection of samples of different kinds of toweling, learning the prices and distinguishing features. After testing with red ink let each determine whether linen or cotton would be best for toweling. Linen is best because it absorbs moisture more readily. These samples should be labeled and kept or mounted in a textile book kept for the purpose.

Second Week.

Weaving. Weaving is the process of interlacing two sets of parallel threads at right angles to each other to produce cloth. No one knows just when the first weaving was done. The first kind of weaving that was done was probably that of interlacing branches of trees to form the roofs of the homes of the people. Later reeds and grasses were woven to form mats to use in the homes. Later the women wove baskets. From these crude beginnings probably developed the idea of weaving cloth. There has been a wonderful evolution of the loom. When weaving was first done it was done by hand on a loom made of two bars with the warp threads stretched between. The woman stood in front of the loom and wove the thread back and forth, guiding it with a shuttle, which was a small

wooden piece into which the end of the wool thread was fastened. The loom on which the Navajo Indian weaves his blanket is one of the primitive types. The loom used in Colonial times was very similar in construction except that the warp threads were stretched out in front of the woman, as if they were on a table, and as she wove the cloth it was rolled up on one of the beams from which the warp threads were stretched. The first loom that was run by other than hand power was invented in 1785. The power loom was not used in this country until after the War of 1812. Now practically all material used is made on power looms of very complex structure. Where possible, a visit to a factory where weaving is done should be planned and made.

The laboratory work this week should consist in finishing the towel. Materials should also be selected for the making of the marguerite. Long cloth is the best material to use. A discussion about the buying of lace would be good here. Examine the edge which is used in sewing on to the garment to see whether it is firm and durable. The scalloped edge of lace should also be firm and that which has few picots looks best after washing. The figures in the design should be held together well, as these threads will break apart easily if too fine to support the weight of the design. Use lace that suits material on which it is used. Torchon lace will not suit on long cloth. Linen or German Val lace is better.

Where there is no laboratory work to be done an examination of samples of muslins, long cloths and cambrics should be made to see what are the distinguishing characteristics. Muslin is woven of heavier thread than either of the others and is therefore a heavier material. Long cloth is made of finer yarns and never has much stiffness in the finish. This is easy to use for sewing by hand. Cambric is not much heavier in weight than long cloth, but it is finished and starched in such a way as to make the material less pliable than either of the others. If possible examine a cheap and a good grade of muslin and determine what makes the difference in price. Learn the widths and prices of the three materials.

Third Week.

Weaves: The manufacturer today has many methods of weaving material and often textile materials are classed according to the method by which they are woven. The different weaves are (1) Plain weaving, (2) Twill weaving, (3) Satin weaving, (4) Figure weaving, (5) Double cloth weaving, (6) Pile weaving, (7) Gauze weaving, (8) Lappet weaving.

Plain weaving is weaving one thread over and one under each time, reversing the order in the second row. Ginghams, muslin, long cloth, calico and percale are examples of where this weave is used. A twill weave is one that produces diagonals across the cloth. The twill weave is used in making serge and denim. The satin weave is a twill weave so arranged that the twill does not show. Satin and sateen are examples. A figure weave is used to weave figures into materials. This can be done in the loom by use of an appliance known as the Gacquard apparatus which automatically directs the weaving. The double cloth weave is a weave where two single cloths are combined into one in the loom. This makes a very heavy material and is used for weaving over-coating, cloakings, golf cloth and all double faced materials. The pile weave is one that produces a pile or loop on the surface of the cloth. Velvets, turkish toweling and carpets have this weave used in their manufacture. Gauze weaving produces lace-like effects in materials. It is used in making fancy curtain materials. Lappet weaving produces embroidered designs in materials. Dotted swiss is an example of a material where this is used.

The plain weave and twill are used a great deal. There are many kinds of twill weaves, and materials having fancy twill weaves are often called "Diagonals."

The laboratory work[1] should consist of making a model showing how lace should be sewed on a hemmed edge. The marguerite should be cut out and begun.

Where no laboratory work is given the girl should study samples of cloth to determine the weave used and should decide which would be considered of best wearing quality. Drawings of the plain or twill weave should be made, or they may be woven with yarn on a school loom. A stiff card can serve as a loom by piercing the edges through which the warp threads can be woven. The weaving may be done by using a blunt pointed needle as a shuttle. Colored mercerized cotton floss may be used.

Fourth Week.

Cotton: There are records which tell us that India has grown cotton longer than any other nation. There are writings of 800 B. C. which mention a highly developed cotton industry there. In Egyptian history the first mention of cotton was made in 325 B. C. Columbus discovered cotton in the West Indies. At present the

[1]Write for Extension Bulletin 23, Agricultural Extension Department, Purdue University, Lafayette, Ind.

growing of cotton is a very important industry in the United States. During the Civil War, when the Southern people were too busy to grow cotton, cotton materials became very expensive and elaborate dresses were made from cotton cloth. There are many kinds of cotton grown. Sea Island, the kind raised on the islands along the coast of South Carolina and Georgia, is a very fine cotton. It is the most valuable kind on the market. Egyptian cotton is next best in grade. The kind grown in this country is known as Upland cotton. It has rather short fibers and is not as fine as the others. Cotton is picked by hand because no machine has yet been invented which seems satisfactory for doing the work. The bolls of cotton ripen at different times on the plant and this makes picking difficult to do by machinery. After the picking is finished the cotton is ginned. This is the process of separating the seeds from the fiber and is done in a machine called a cotton-gin. Before the gin was invented, cotton fiber was separated from the seed by hand. Five pounds of cotton could be picked from the seed by one person in a week. By the use of the gin five hundred pounds may be seeded in an hour. After the seed is removed the cotton fiber is put into bales or large bundles. The bale is wrapped in burlap and bound with iron hoops and is then ready to send to market. The cotton when it reaches the mill is cleaned, carded and spun. It is woven in many ways and many cotton materials are found on the market. *Study the distinguishing features of such materials as calico, percale, dimity, gingham, etc.* When possible have large enough pieces of material so that the width is shown.

The marguerite should be finished in the laboratory work this week. There is no objection to allowing some of the work to be done at home provided the work is done well. It is usually easy to detect when the work is being done by someone else. This garment should be made by hand as the child is not yet well enough trained in handsewing to allow the use of a machine.

When no laboratory work is possible the child can collect cotton materials and make a booklet on "Cotton."

NOVEMBER

First Week.

The Flax Plant. The linen fiber is obtained from the vegetable kingdom or flax plant. This plant is not grown in the United States save for seed, but is extensively cultivated in Russia, Belgium, Ireland, Italy, France, Holland and Egypt.

There are many varieties known to the botanist. The plants are annuals and grow from 20″ to 40″ in height. The flowers range in color from a faint yellow to a light blue.

When used for the fiber the crops are rotated, the seeds are sown broadcast, and quite thick, so that the plant does not have many branches. When ripe and ready for use, the whole plant is pulled up, because if the stem is cut or broken, the sap seeps out, and the fiber is not of such good quality.

After the plants are pulled they are placed in bundles and dried. Then the "rippling" process, the combing out of the seeds, pods and dried leaves takes place, care being taken not to break the stems. The stalks are then tied in bundles and are referred to as "straw."

The seeds of the plant are used to make linseed oil, linseed cakes, used for cattle feed, or linseed powder, used for poultices. After the "straw" has been obtained, it is put through a process known as "retting"—a most important process. The bundles are placed in cold water for fifteen days. A quicker but less satisfactory method is one in which chemicals are used, the process covering but 60 hours. By this process the fibers are often weakened, which makes it less satisfactory.

A third method is that of placing the straw in a field, and leaving it for the winter. The flax so prepared is usually dark, and does not make as fine grade of linen as does the pale yellow or white. After the "retting" process, the fibers are separated from the woody bark or core, by pounding. This breaks up all woody parts and loosens the dirt. The work is carried on either by hand or machinery.

The "scutching" process is still further used to clean the fibers. The long ones are separated and known as "line"—the shorter ones as "toe." The fibers are then drawn out into long ropes, slightly twisted, and finally spun into yarn, the stronger yarn being used for warp thread, the shorter being used for woof or filling threads in linen materials.

Laboratory Work: From a large piece of canvas (Ada) have each girl cut a piece 5″ x 3″ (first dimension always width). Cut along woof thread for length, warp for depth. Make rows of chain stitching with heavy linen thread or use a piece of coarsely woven linen with colored thread. Use weave for guiding each stitch as to length. The stitches are thus regulated mechanically, and the principle of stitching easily seen.

Where sewing is not taught in the laboratory, samples of linen used in the home might be brought to school mounted in the textile book, along with price and special use of each. Compare samples of cotton and linen texture, etc.

Second Week.

Laboratory Work: Make a sewing apron—preferably of checked gingham. The checks mechanically regulate the length of stitch, aid in keeping the line of seam straight, and give practice in matching checks. Use fine thread 80 to 90 white, and good needle, No. 9. Fine thread sinks into the weave, wears better, and makes a better finished garment.

Where no laboratory work is given samples of striped or plaid ginghams could be used showing proper and improper ways of matching. Use glue instead of sewing seams.

Third Week.

Laboratory Work: Continue work on apron.

Where no laboratory work is given, assigned reading in Carpenter's "How the World is Clothed" would be beneficial, or the organization of a girls' sewing club would be helpful. Many of the children in the rural schools could bring material, and meet for a few minutes at the luncheon hour. With a few directions from the instructor much pleasure and many useful articles would be the result.

Fourth Week.

Laboratory Work: Take up the study of *Dyeing Materials.* There are two methods of dyeing, that of dyeing the yarn before the goods is woven. This is a most satisfactory method because every portion of the yarn is thoroughly dyed. An example of material in which yarn is prepared by this method is chambray having the yarn dyed thread for warp, and the white for filling or woof. Have children bring samples of chambra from home, fray it and let them see how it is woven.

Another method of dyeing is that of piece dyeing after the goods is woven. Generally speaking this is not as thorough a method as the yarn dyed, because the dye does not penetrate to the under thread in the weave. A piece of blue calico would illustrate this method. Fray out and note white specks along woof and warp threads Mount in textile books with notes, and inferences as to better method.

Printing is another method of putting color into materials, such as calico, white goods, and sometimes silk. Plain materials are chosen usually, and by means of a block, patterns are pressed on the surface, which often wash off the first time the garment is laundered. Sometimes strong chemicals are used, and the pattern eats out the goods when laundered.

Have children bring samples of printed materials, samples which are new and of the goods after wear or washing and note difference. Also make a list of colors they know to fade easily in the sun or when washed. Mount samples of these.

If no machine work has been done, have each child practice sewing a straight seam on machine. Also a straight hem. Use a piece of muslin, long cloth or cambric, 7″ x 5″. Cut in two pieces, 4″ x 5″ and 3″ x 5″. Baste, making two seams, sew on machine. Turn a 1/8″ hem on the long side, hem by machine. This involves two problems, that of stitching a straight hem, and of stitching through four thicknesses at the crossing of seams.

If there is no machine in the laboratory, an over-hand patch of checked gingham may be made. Gingham 4½″ x 4½″, patch 2½″ x 2½″. Match checks. Baste carefully. Over hand, holding seam parallel to body, work from right to left, needle pointing towards you.

Where no laboratory work is given, mount samples showing yarn and piece dyeing, also printing. Writing notes from talks given and observations made.

December

First Week.

The Giving of Christmas Gifts. Christmas stands for the anniversary of the birth of the Christ child. The beautiful story should make it the most sacred of all the year. Washington Irving says it is "the season for gathering together of family connections, and drawing closer, again, those bands of kindred hearts, which the cares and pleasures and sorrows of the world are continually operating to cast loose; of calling back the children of a family, who have launched forth in life, and wandered widely asunder, once more to assemble about the paternal hearth, that rallying-place of the affections, there to grow young and loving again among the endearing mementos of childhood."

A modern abuse of the Christmas spirit is the promiscuous giving of presents, which is almost a national grievance. In some

localities, giving has developed into a rivalry in which time, strength, health and happiness are often sacrificed. It is the aim this month to have the children make simple home gifts, modest, yet often more treasured than expensive ones, because they may represent the first gift actually made, and because of the individuality and the appropriateness of the gifts.

Laboratory Work. The work this month will be the making of inexpensive, easily made remembrances, in which the stitches taken up in previous models, will be used. Iron holders of pretty colored denims, with solid colors or figured, or flowered cretons—any cotton material which is washable may be used. The holder should be at least 6″ x 5″, three or more thicknesses to protect the hand from the heat of the iron. The edges are to be carefully turned in, basted and the overhand stitch used. In order that the various thicknesses stay in place when washed rows of running stitches or back stitches (whichever is more suitable) may be used, as quilting.

Dust cloths make an appropriate and dainty gift. They should be made out of cheese cloth, preferably white, because the dirt shows on the white, and the frequent washing does not affect the white as much as the colors. An inch hem should be basted carefully on each end and then chain stitched in with a pretty colored thread.

If no laboratory work is given, a collection of samples of gingham from home might be brought and cut into pieces for the note book.

We have many varieties of gingham. Domestic, including the coarse, heavily sized apron gingham, and Scotch, which is also heavily sized, usually a conspicuous plaid, which fades after washing. These are both cheap ginghams which shrink and fade. Since they are so commonly used, too much cannot be learned about them. Have samples of gingham before and after washing and compare.

Have samples of Chambray, French, Scotch, Tissue and Kindergarden ginghams. Discuss as to price, combination of colors, suitability for school dresses. Contrast, if possible, new pieces and pieces from worn garment. Mount all in textile book.

Second Week.

Choice of colors used in Christmas gifts is an important factor. At present the plant most symbolic of Christmas festivities is the holly, probably because of its green leaves and vivid red berries.

Closely associated with the holly are the mystic mistletoe and evergreen. The red poinsetta has grown to be almost as symbolic of the season as is the holly. In selecting gifts, if appropriate, the green or red might be used. However, daintiness and neatness or usefulness should be emphasized in every case. No gift should be planned or color selected without the guidance of the instructor.

Laboratory Work: A small needle book for the sewing basket would be an appropriate gift. Discuss colors and combination of colors. Scraps of new silk brought from home, or if that is not possible, often the instructor could obtain pretty new pieces from friends, thus doing away with all expense. If material must be bought, a few cents from each child would be quite sufficient for the purchasing of material. An all-over pattern always cuts to better advantage. Every scrap can be used by making some square, some oblong, and some round. Use a cardboard foundation. Cut cover large enough to turn in 1/8″. Baste carefully and overhand with silk to match.

If no laboratory work is given, collections of Christmas colors showing combinations of proper shades could be made and mounted in the textile book.

Third Week.

A gift has dignity, is much more pleasing to the giver and the recipient if neatly and appropriately wrapped. In the last laboratory period gifts will be finished and wrapped. Discuss choice of colors in papers and ribbons, make suggestions both in regard to inexpensive wrapping and colored thread. Encourage individuality. Have children collect appropriate verses and greetings to use with gifts.

Laboratory Work: Simple bags. Silk ribbon, silk by the yard, linens or white material would be suitable. Aid child in selecting design and material. If an apron is more appropriate for gift, it should be made. The instructor should aid in selecting material, design and trimmings. Children should be encouraged to make their own selections and put their individuality into the work.

If no laboratory work is given, a collection of materials suitable for sewing aprons, or work aprons could be made and mounted in the textile book. A discussion of suitability of aprons, along with the proper care of clothing (aprons a protection) and a few simple tests for removing stains from aprons might be brought in very nicely.

Fourth Week.

Laboratory Work: All gifts are to be finished, pressed, inspected by instructor, carefully and neatly wrapped. If there are other instructors in the building, an exhibit before wrapping would no doubt be enjoyed by the instructors and pupils.

JANUARY

First Week.

In the classification of fibers, we have three from the animal kingdom, namely, wool, silk and mohair. An animal fiber is a nitrogenous substance. It may be an appendage to the skin as wool or hair, or it may be a secretion as silk.

Wool is obtained from the sheep. History tells us that linen and wool were spun and woven about the same time. Bones of sheep found in the graves of people, of prehistoric times, proves sheep of great value. However cultivation has improved the character of the fiber, and now Australia, Argentine and the United States lead in wool production. Russia, New Zealand and Great Britain come next. (Correlate with geography.) In the United States the greater number of sheep are raised in states west of the Mississippi.

Sheep must be well cared for to produce good wool. The fibers are then even in length and contain an oil called *yolk,* which gives softness and pliability to the fiber. Wool from poorly cared for sheep is uneven in length, and has little oil. The fibers are brittle and the color is not good. The fiber when observed under the microscope is seen to be covered with little scales. The length of the wool fibers vary from $2\frac{1}{2}''$ to $10\frac{1}{2}''$, according to breed of sheep. There is a marked difference in fibers from the animal. Those from the hind legs and tail are coarse and of poor quality. Those around the neck are short. The best fibers are obtained from the shoulders and sides of sheep. The wool or fleece is removed or sheared from the body in an entire sheet. The fibers are then assorted according to length and quality, then scoured by washing wool in moderately warm water and soap until thoroughly clean. This is then dried at a low temperature, because too high a temperature would injure the fiber. The fiber is then taken through carding, spinning and weaving processes, the final product being wool cloth.

Laboratory Work: Collect and discuss common samples of plain weaves, for example broad cloth and white flannel. Cut and

mount in textile book. The burning test, which is a very simple one, should be made. Pull out some threads and burn. Notice the time, manner in which it burns, also the characteristic odor (that of burning feathers). At the same time burn some cotton threads, compare, as to length of time it takes to burn and odor produced.

Start the mending model. A piece of plain woven material, either colored or white flannel, about 5″ x 5″. Cotton thread to match. With a pair of blunt scissors cut a three-cornered tear. Hold raw edges together with small basting—basting corner of tear first. Then with small running stitches mend tear, leaving bastings in to help strengthen. Press very carefully. Insist on a tear being mended in a garment at home, and brought to school for inspection.

Where no laboratory work is given, if some elderly person in the neighborhood, who has carded, spun and woven home spun cloth, could be persuaded to come and give a talk, much information could be obtained.

Second Week.

Other materials for the textile book should be collected, discussed and mounted. We have many other weaves besides the plain weaves in wool materials. Among the more common ones are serges, English tweeds, covert cloth and many others. Review methods for dyeing materials. If possible bring out points in selecting colors which harmonize, and suitable plaids, so commonly used for children's school dresses. Use a piece of material which you know to be part cotton, try burning test.

Laboratory Work: Stocking Darning. This is one of the most practical lessons given. It would probably be easier for the pupil if a hole in a piece of a stocking was tacked on a piece of card board and darned in this way. Use thread to match the stocking. The process could be easily brought out, and a neater model obtained—especially where there has been no experience in this line of work.

Where no laboratory work is given, directions for this work should be given and the work done at home. The mended stockings should be brought to school for inspection.

Third Week.

One of the big industries in the United States is that of manufacturing stockings. In primitive times the woolen stockings were

all knitted at home from home spun yarn. This knitting of stockings is still done in some sections of the country. However, the greater number of people probably wear machine-knit stockings. We have many kinds, grades and colors. The more common are cotton, wool, lisle, fleece lined and silk, and range in price from 12½c to $3.00 per pair, depending upon the kind and quality. However a good pair of hose can be bought for about 35c. They should be long enough that the foot is not cramped, there should not be heavy seams across the toe or bottom of the foot. Why? Too cheap stockings are often so poorly dyed that the perspiration from the foot causes the dye to come out and often poisons the foot. If possible have stockings of different weight and price to bring out point in talk.

Laboratory Work: Children are to darn a stocking or pair of stockings, depending upon the number and size of holes, and time.

Where no laboratory work is given, a study of the manufacture of stockings could be taken up. If children have access to magazines, have them cut out advertisements of firms making hole-proof stockings, thus becoming familiar with names of firms, good points about stockings, and price per pair. Mount advertisements in textile book. Encourage home work in mending and darning.

Fourth Week

This week the night gown will be started. Material and trimmings should be selected by the child, but under the direction of instructor. If enough pupils in class, a bolt of long cloth can be purchased at a reduction. The suitability, wearing qualities and price of trimmings should be discussed. A cheap material as well as a flimsy, coarse, weak-edged trimming are always expensive in the long run. Discuss and tell *why* certain selections should be made. Discuss kinds of lace used for underwear, such as torchon, linen and valenciennes.

Laboratory Work: If there is a machine in the laboratory, a gown with sleeves should be made as this gives practice in putting in sleeves. However if the gown must be made by hand, a kimona pattern should be used. Each girl should cut out her own gown. If pattern is too small the teacher should explain the principle underlying altering. If too large, show how to alter; likewise too short or too long. Use French seams in sewing up gown and sleeves. Care must be taken so that the seams are wide enough to cover rough edges. Hem around neck, bottom of sleeves and

bottom of gown. Baste each seam and hem carefully. The neck and sleeves must be finished according to trimming used. If lace is used, overhand on edge of hems, if embroidery, a flat fell or French seam should be used.

Where no laboratory work is given, make a collection of materials and trimmings used in the home for underwear. Mount in textile book, along with width, price and amount of each required for garment. From price list of ready made garments, compare cost of home made garment. Which is cheaper? Which better for same amount of money?

February

First Week.

Silk: We are this month taking up the subject of silk. The silk fiber is obtained from the animal kingdom. It is our most expensive fiber. Tradition says that the culture of silk began in China in 2700 B. C. Silk raising is still an industry in both Southern and Northern Europe. The culture was started in America about 1622, in Virginia, but we can not compete with the Orient or South Europe because of their cheap labor.

The principal silk-rearing countries at the present time are China, Japan, Italy, France, Spain, Russia and India. China is perhaps the leader with Japan a close second. The cultivated silk worm passes through four changes in its life of a couple of months, the egg, larva, chrysalis or pupa, and the adult—a creamy white moth about one inch in length. The moth lives only three days.

The eggs are small, dark, flat and round. The worm when hatched is about the diameter of a hair and less than three-fourths of an inch long. Under the magnifying glass one can see long hairs, many legs and a shiny nose. The worm feeds upon mulberry leaves. About thirty meals a day are eaten in the first stage. When fully developed the worn is about three inches in length, white and velvety. As it approaches maturity hunger lessens and it begins to inclose itself in its silken shell by expelling, from two openings under the mouth, two delicate threads which form a single one. By the motion of the head, a sort of figure eight is woven by the thread and the worm is gradually inclosed in the interior of the cocoon.

Laboratory Work: Continue work on gown. Where laboratory work is not given the collection of lace samples for textile

book should be discussed and mounted. See library list of references to use in textile work, pp. 110 and 119-20 below.

Second Week.

Study of Silk Continued: Silk is our longest fiber, varying in length from three hundred to fourteen hundred yards. After fifteen to twenty days are spent, a moth is developed in the cocoon. It moistens the end of the cocoon and breaks its way out. Cocoons may be white, yellow or greenish in color.

The fiber as it comes from the cocoon is covered with a gum, which is removed by boiling. The fiber is a creamy white or pale yellow. The cocoons should be baked before the moth has a chance to emerge so that the moth is killed and the fiber of the cocoon is not broken.

Various diseases and parasites attack silk worms, and vast sums of money were lost until great care was exercised in securing eggs from perfectly healthy moths. Good food in the form of flawless mulberry leaves is necessary. The worm must be fed regularly and must be cared for in a very careful way.

Laboratory Work: Work on the gown should be continued. When finished a lesson on hemming a napkin, or towel, to teach the nappery hem and its use could be commenced. Turn first fold, then second, making a hem from $\frac{1}{8}$"-$\frac{1}{4}$" in width. Baste carefully, turn hem back right sides together, holding material parallel to body, hem next to body. Beginning at the right overhand. Each girl could hem one napkin or one end and these could be used in school work when serving meals. Towels could be used in connection with the laboratory work. This would be a good chance to teach personal hygiene—the use of an individual towel.

Third Week.

Study of Silk Continued: We have two distinct classes of silk. (1) That produced by the cultivated silkworm, carefully reared and fed on white mulberry leaves, producing a silk fine and even in size. (2) The wild silk produced by the worm which has not been well cared for, and fed on other things. This produces an inferior silk, coarser and very uneven. The wild silk furnishes a large class of materials such as pongee. China, Japan and India all produce wild silks.

One of the most important and tedious processes, is the *Reeling.* The cocoon is floated in boiling water, then brushed, until the filaments which will unwind to the center of the cocoons are found.

They are then wound on the reel. The silk from several cocoons is united, twisted slightly in the fingers and passed through an agate or smooth glass eye and attached to a swift or reel. After this raw or reeled silk is obtained, the next process is that of *throwing,* the process by which it is made into yarn for weaving. The reeled silk is strong enough to weave, but if dyed the threads would open up, so that the skeins that are to be dyed must be more or less twisted. Great care is always exercised in removing the gum. All silks do not require the same treatment, for the gum is more difficult to remove in some cases.

After cleansing or dyeing, the skeins are wound in various ways on bobbins, according to the use to which they are to be put. Silks which are to be woven are warped immediately. Silk warping requires the most delicate handling (review subject of warping cotton and linen). The weaving of silk is much the same as other weaving, though special silk looms are built.

Laboratory Work: The work this week should consist of work on button holes, and the proper method of sewing on buttons. Use cotton materials several thicknesses, measure button and cut hole accordingly. Before cutting the first one, measure so as to have them evenly spaced. The button hole stitch is made by pushing the needle through towards the body, throwing the double part of the thread under the end of needle, thus making a knot or "pearl" edge on button hole. When a button hole is "barred," the bar is made by taking three or four stitches across the end of the button hole, and these stitches in turn button holed, throwing the pearl towards the button hole. Make a number of button holes. Have girls bring garment from home and make all the button holes in it.

Also give directions for sewing on buttons, using a pin, so that a shank will be formed. Be careful that the eyes of the button are parallel to the button hole. Sew buttons on garment in which button holes were made.

Where no laboratory work is given, give directions for making button holes at home, and urge mothers to supervise work, then bring garment to school for inspection.

Fourth Week.

Study of Silk Continued: Silks like other textiles are adulterated. Because it is the most expensive textile it is probably adulterated more than any other. It may be adulterated with

cotton, because the cotton is so much cheaper and can be used without being discovered by an inexperienced person.

A very common adulteration is that of weighting with metallic salts. This gives additional weight. The silk looks well and feels heavy. Deterioration will often occur while the gown is being constructed, in lying on the shelves in the store or hanging in the closet. Often a piece of silk heavily weighted, if held to the light will show threads or streaks which look like tinsel—this is tin weighting.

Silk is often injured by the use of strong chemicals used in the dyeing processes. Discuss different kinds of silk. If possible have a collection of inferior and good silk, also pieces showing print, weave, etc.

Experiment: A simple but interesting test could be made by the instructor. Take two small pieces of silk—one you know to be good, the other weighted. Burn. The good silk will burn slowly and leave little ash. The weighted silk will leave ash in just the form or shape of the original silk.

Laboratory Work: Make a collection of printed, inferior and good silk. Carefully trim and mount in textile book, noting width and price. Make list of different articles made of silk. Cost of silk thread, number of yards on spool—how numbered, and price per spool.

Make button-hole on wool material, using silk thread. Also sew on hooks and eyes, covering same with silk thread—using the buttonhole stitch. Why cover them this way?

Where no laboratory work is given, the booklet on silk should be finished; the collection of silk made, and the burning test by instructor made.

MARCH

First Week.

Review and discuss the various kinds of seams and their uses. The new seam to be taken up is the French seam. It is a seam within a seam. It is used on underclothing and garments made of thin or sheer material, where a raw seam would be objectionable.

Laboratory Work: Make a model showing the method of making a French seam. Place *wrong* sides of material together. Baste carefully 1/8″ from edge. Sew, using fine running stitches. Remove bastings. The seam is now on the *right* side of material. Turn, crease and baste carefully, just beyond the edge of the first

seam. Use fine running or combination stitch. Compare with plain seam and flat felled seam.

To Learn to Cut a True Bias: The warp threads are the lengthwise or heavier threads, which correspond to the carpet chain in a carpet loom. The woof threads are the filling or crosswise threads. (Explain this by fraying a piece of material.) In cutting a true bias the material is folded in such a way that the warp or lengthwise threads are parallel to the woof or crosswise threads. Crease, using this crease as a guide, and by the aid of a ruler, put in dots indicating the width of bias strip which is to be cut.

Where no laboratory work is given, a discussion in regard to clothing should be taken up.

Suggested points for discussion—cost of clothing, durability and suitability.

Second Week.

Cooking Apron: Make an apron of long cloth with a bib suitable for use in the cooking laboratory. Select a simple pattern. The white aprons are used in laboratory because they show the dirt and are therefore more hygienic and sanitary, because they are washed oftener. They make a better appearance and give dignity to the work

Laboratory Work: Have girls measure length of skirt and bib and alter pattern according to measurements. It will take time, but have each girl cut her own apron—under supervision of instructor. See that the pattern is pinned onto material correctly and explain the use of the markings on the pattern.

Where no laboratory work is given, from collection of cotton materials in textile book, have the girls select suitable material for house dress, give reasons for selection. Discuss price, amount necessary for a dress. Also wearing qualities—whether easily faded by sun or washing.

Continue Work on Apron: Cut true bias facings, and if time permits, baste skirt of apron. Use French seams in apron.

Where no laboratory work is given continue the study of selecting a wash dress. From the various magazines cut out the fancy work or pattern sheets. Use these to illustrate good and bad color combinations. From uncolored pattern sheets obtain simple, suitable dresses for growing girls, and with water colors or crayons work out color schemes. Mount in textile book, along with explanatory notes.

Third Week.

Continue Work on Apron: Baste the bias facings on the bib, holding the bias piece next to the body. Use fine basting stitches because the bias piece has a tendency to slip. If there are no machines in the laboratory and it seems advisable, let the apron be taken home, the seams in skirt and bias facing on bib *carefully* stitched, using *fine* thread. Why?

Where no laboratory work is given have the girls make a list of the clothing worn in summer; clothing worn in winter. Discuss with them the different kinds from a hygienic, economic, and aesthetic standpoint. (Correlate with lesson in hygiene or physiology.) Mount list in textile book.

Fourth Week.

Continue Work on the Apron: Finish the skirt of the apron, making French seams. If there is no machine in the laboratory baste the hems and stitch at home. Use a $\frac{3}{8}$" hem on sides of apron. Be sure to keep the stitching straight and to use fine thread.

Where no laboratory work is given, continue the work taken up last week, using the list made out by each girl. Have her figure out the cost of her summer clothing, her winter clothing. If she has no idea of the value of clothing, give help by means of general price list. Mount all lists in textile book.

APRIL

First Week.

Continue Work on the Apron: Before the class commences work take up the subject of turning the hem on the apron, also proper method of putting in gathers. Discuss method of putting belt on sewing apron.

Laboratory Work: Straighten the bottom of apron by placing on girl and measuring up from floor for the proper length. Turn hem desired width, lay in plaits where needed. Baste carefully. Stitch hem on machine. Gather top of apron, and sew on band according to directions given for placing band on sewing apron. Remember that the bib is to be put on.

If no laboratory work is given, a talk on the care of school clothes would fit in nicely. "A place for everything and everything in its place," saves time. Discuss improvement in appearance when shoes are polished, heels are straight, buttons on and good shoestrings in them. "A small hole in a stocking is more easily mended

than a large one.'' Hair ribbons which are taken off before retiring and carefully untied, last longer and look neater than ribbons not removed at night. A tactful discussion would no doubt mean much to the class.

Second Week.

Laboratory Work: Finish apron. Stitch the bias facing on bib, join to skirt by finding center of bib and center of front gore. Work button holes and sew on buttons, not forgetting one for holder and towel.

If no laboratory work is given, prepare a paper on ''The Sewing Machine.'' When first manufactured, by whom. List the standard machines. Discuss the cost of good machines. Discuss kind used in home.

Third Week.

The laboratory period this week should be spent in finishing any back model or garment. Press, mark and mount ready for the exhibit.

If no laboratory work is given, finish the textile book. See that all the written work and samples of textiles are properly placed, and the book made as attractive as possible. Encourage individuality. If sewing clubs have been organized, give directions for pressing, marking and mounting articles for exhibit.

Fourth Week.

Arrange an exhibit of all work done by pupils. Talk over the arrangement of exhibits and have girls assist. Make the exhibit just as attractive as possible. The girls should act as hostesses.

7. Suggestions for a Study of the Planning, Care, Furnishing and Upkeep of the Home

The planning, care and management of a home constitutes one of the most important lines of work which most women are called upon to do, because it represents one of the more important problems connected with the occupation of home-making. The following course on "The Study of the House" was planned to give teachers practical help in the study of this group of problems. In this outline a way of developing the particular topics taken up in the course has been suggested, which it is hoped may prove interesting and profitable to seventh and eighth grade pupils.

The problems suggested are by no means all that could be given. Others which may better fit into the needs of the individual school will suggest themselves to the teacher, in which case the ones best suited to the needs of the community should be given attention.

The questions are asked not pedagogically but to give information and at the same time inspire in the pupil a spirit of inquiry and method of investigation, and thus save time. The emphasis has been put on the construction and care of the house.

It is desirable that each pupil keep a note book in which they work out the various problems taken up, preserving in permanent form information and illustrations which they may be able to gather either from reading or from observations made during the study of the problem. Much of this work can be done out of school and the pupils should be encouraged to use the home as far as possible as a laboratory for trying out problems studied at school. In some cases pupils might help take care of the school room. Proper methods of ventilation, sweeping, dusting, cleaning windows, washing paint, building fires, blacking stoves, etc., may all be taught in the school room. *Each problem taken up should so far as possible be made one in arithmetic, drawing or language as well as a problem in domestic science.*

a. OUTLINE FOR A STUDY OF THE HOUSE[1]

(1) Choosing a Site for a Home.

Problems.

1. Observe sites in a locality where houses have been built and list desirable and undesirable points.

[1] This Outline for a "Study of the House" was prepared at the suggestion of the State Department by Mabel Thacher Wellman, assisted by Georgia E. Finley and Edith Williams, of the Department of Home Economics, Indiana University.

2. Find a desirable location for a building site on which a house has not been built and give reasons for selection.

Questions.

1. Is the location in a desirable neighborhood? For what reasons?

2. Is it located conveniently to business, town, schools, and church?

3. Are the trees located so that they give shade and yet do not make the roof damp or shut off light and air from the house?

4. Is it located in a quiet neighborhood, where the noise is not a constant strain on the nerves?

5. Do the north rooms have an east or west window to admit sunshine into the room some time during the day?

6. Is there enough loam in the soil to produce a good lawn or garden?

7. Is the site on high or low ground?

8. If on low ground, are there subsoil drains which lower the ground water level to one foot below the cellar bottom?

9. If on high ground, is it sloped from the house one foot in one hundred feet, or enough to drain off the water from the rain and snow?

10. Is it located near a factory or other places which give off offensive odors or a large amount of smoke?

11. If a farm house, is it located far enough away from other farm buildings that the odors do not reach the house?

12. Is there a manure pile near the farm buildings, which provides a breeding place for flies, or is the manure hauled directly to the fields?

13. Is there a dry cellar under the house?

14. If there is no cellar is the house and porch enclosed with a wall which has openings for ventilating the space under the house or with a lattice which will keep out the cats, dogs and chickens?

15. Is it located in the neighborhood of a swamp or stagnant pond which provides a breeding place for mosquitoes?

16. If a city house, what is the source of the water supply?

17. What way does the city provide for the disposal of ashes and garbage?

18. Is the city well protected against fire?

19. Does the city provide and enforce good city laws?

References.[1]

House Sanitation: Marion Talbot.
Food and Sanitation: Forester and Weigley.
Bulletins: Modern Conveniences for the Farm Home.
Farmers' Bulletin No. 270.
The Farm House. Cornell Reading Course.
Farm House Series, No. 6.

(2) Cellars

Problems.

1. How many houses in your locality have a cellar under the whole house?
2. List the materials used to construct the walls and floors of the cellar.
3. What is the cost of each material?
4. What would it cost to construct cellar walls of each?
5. Draw the outside walls of the cellar, indicating the location of the windows and the height of the wall above the ground level.

Questions.

1. Is the cellar built under the whole house, making it cooler in summer and warmer in winter?
2. Is the cellar built on high enough ground or drained to insure dryness at all seasons, or is it damp enough for growth of molds?
3. Is the floor cemented, making it easy to keep clean?
4. Are there windows on different sides, giving a free circulation of air?
5. Are the windows screened to keep out flies and other insects?
6. Is the cellar wall built three feet above the ground level, making the space high enough to build windows which let in plenty of air and sunshine?
7. If it is an old cellar and the house is not set three feet above the ground level, could a sloping place be built and the windows lowered to admit air and light?

References.

The Healthful Farmhouse: Helen Dodd.
House Sanitation: Marion Talbot.

[1] For names of publishers and prices of books and bulletins referred to in all Lessons on the House, see this bulletin, pp. 103 and 104.

Shelter and Clothing: Kinne and Cooley.
Bulletin: Modern Conveniences for the Farm Home. Farmers' Bulletin No. 270.

(3) Construction of the Framework

Problems.

1. If possible examine the framework of a house in process of construction. Learn the parts in the structure and the use of each.

2. The main parts of the framework of a house are: footing, foundation walls, sills, girders, joists, plates, corner posts, studding, sheathing, clapboards, furring strips, rafters, lath, cornice, shingles, and flashing. Find these in a house. If you cannot find a house in the process of construction, the inside of a barn or shed will show many of the parts.

3. Make a drawing of the framework of a house.

4. Observe the construction of the foundation walls, the outside walls, and the inside walls.

5. Observe how the roof is put on.

6. Find out how the floors are laid.

7. What materials are used in your locality for the outside walls of the house?

8. How do they compare as to cost and length of time they last?

9. What materials are used for roofing in your locality? What other materials may be used?

10. How do the various materials compare as to cost, and durability?

11. How are the various materials put on to the roof?

Questions.

1. Are the walls constructed with inter-air spaces which are poor conductors of heat?

2. If the house is built of brick, is there an air space between the tiers?

3. If it is built of veneer, that is stone or cement, is each block re-inforced with tin strips?

4. If it is built of wood, is there building paper and sheathing under the clapboards or shingles?

5. How do the outside walls differ from the inside walls?

6. Are the floors of the house laid double, preventing dust from rising from the cellar?

7. Do the clapboards lap, keeping out rain and cold?

References.

The Care of a House: T. M. Clark.
The House: Isabel Bevier.

(4) Floors and Woodwork

Problems.

1. Make a collection of hard and soft woods used for inside woodwork and floors. Study texture and grain of the wood.

2. Measure the schoolroom and estimate the cost of laying the floor with hard wood, and compare with the cost of a floor laid with soft wood.

3. Estimate the cost of woodwork in the schoolroom, using hard and soft wood.

4. Find methods of finishing hard and soft wood.

5. Compare the cost of finishing a soft wood with paint with the cost of finishing a hard wood with varnish and wax.

6. Make a collection of woods finished with paint, stained, and finished with varnish or wax. Get samples from manual training department or send to a reliable paint firm and ask for material showing different wood finishes and dyes.

7. Collect pictures of interiors of houses and note the style of woodwork which would be the easiest to clean and give daily care.

Questions.

1. Is the woodwork of the base boards, doors, windows, and stair casings easy to dust, or do they have elaborate mouldings?

2. Are the base boards in one piece and with a curved surface, avoiding cracks for the accumulation of dirt?

3. If the floor is soft wood, could the cracks be filled and painted with a good floor paint?

References.

The Care of the House: T. M. Clark.
Selection of Household Equipment. Yearbook of Department of Agriculture for 1914.
Household Decoration. Cornell Reading Course, Farm House Series No. 1.

(5) House Planning

Problems.

1. Get several sheets of cross-section paper. Let the space of one section—usually one-eighth inch to one-fourth inch—represent

one foot. Measure a room either at home or at school. Allowing one space to represent a foot, draw the room on the paper.

2. Measure the walls, windows, and doors and make a diagram on the paper locating the doors and windows.

3. Draw the floor plan of two adjoining rooms on the same sheet.

4. Draw the first floor plan of a small house.

5. Observe how the floor space of houses is divided. Could you rearrange spaces you think inconvenient, so they would be more convenient?

Questions.

1. Are the houses you observed planned to admit the sun into the living rooms and bedrooms some time during the day?

2. Are the windows large enough and in the right places to get the best light and views?

3. Are the windows arranged to get a cross draft—on different or on opposite sides of the room?

4. Are the windows grouped and the doors placed so as to leave wall space for furniture that will be used in the room?

5. Is the living room large enough for the family use and is it connected with the main passageways?

6. Can you see from the front door directly into the kitchen, or is the kitchen door placed to one side, preventing a view into the kitchen from the front door?

7. Is there a built in cupboard or sideboard between the dining room and kitchen or near the pantry, to save steps?

8. Are there built in shelves and cupboards in the pantry for the supplies common to dining room and kitchen?

9. Is the kitchen small enough to avoid the taking of unnecessary steps in doing work?

10. Is there space allowed for the necessary kitchen equipment—stove, working space, table or cabinet made or built in, refrigerator, sink, storage place for kitchen supplies?

11. Are the windows or the windows and transom arranged to give plenty of ventilation in the kitchen?

12. Can the windows be lowered from the top?

13. Are the windows in the kitchen placed at least three and one-half feet from the floor, so that the sink or tables may be placed under them?

14. Is there a place provided aside from the kitchen for the men to remove their work clothes?

15. Is there a separate wash place for the men aside from the kitchen sink?

16. Is the width of the steps in the stairway proportional to the height—rise seven inches, tread ten inches? Count the number of steps up a flight of stairs and estimate space allowed for the stairs.

17. Are the bedrooms all separate rooms, each with its own exit?

18. Are the bedrooms bright, airy rooms with windows providing for a circulation of air?

19. Has the plan been arranged so that the bath room does not open into the dining room or kitchen?

20. If it includes a bath room, is it light and well ventilated and easy to reach from all parts of the house?

21. Does each bedroom have a closet?

22. Has there been an extra closet planned for linen, bedding, etc.?

References.

Successful Houses and How to Build Them: White.
Planning and Furnishing a Home: Quinn.
The House: Isabel Bevier.
The Healthful Farmhouse: Helen Dodd.
Modern Conveniences for the Farm Home.
Farmers' Bulletin No. 270.

(6) Lighting

Problems.

1. Find out the ways in which the homes in your locality are lighted.

2. What is the cost of lighting a house for one month with the various kinds?

3. Find out how gas and electricity are made. Find out the history of kerosene.

Questions.

1. Which of the above ways of lighting is the easiest to keep clean or requires the least care?

2. Which method of lighting uses up the most oxygen and gives off the most carbon dioxide? (An ordinary gas jet consumes as much air as two people and a kerosene lamp as much as four people.)

3. If the light gives off heat and combustible materials, is there provision made to keep the air in circulation, an inlet and an outlet?

4. Is the room lighted with a steady light, with no glare or no direct light in the eyes?

5. Are the lights placed in each room convenient for the purpose for which they were intended—reading, sewing, toilet, general use?

6. If the light is for reading and sewing, does the shade throw the light upon the book or work?

7. Is the light arranged to throw the light over the left shoulder?

8. Is the dining room light arranged so that it does not carry the light directly to the eyes of the people seated at the table?

9. If the lamps are used, are they cleaned every day?

10. Is the reservoir filled to within one inch of the top or with sufficient oil to last one evening?

11. Is the wick and burner kept clean so that it does not give off offensive odors?

12. Is the wick trimmed first with sharp scissors and then wiped with soft paper?

Note: To clean a very dirty lamp or a lantern burner, remove the wick and boil for ten minutes in a quart of water to which two tablespoons of washing soda have been added. Wipe the burner dry and replace the wick.

13. Are the bulbs and shades dusted frequently and are they given a thorough washing before they become so blurred that they dim the light?

References.

House Sanitation: Marion Talbot.

Food and Sanitation: Forester and Weigley.

Bulletins: Housekeeping and Cooking Lessons for Rural Communities. Hampton Institute, Hampton, Virginia.

Rules for Cleaning. Cornell Reading Course. Farm House Series, No. 4.

(7) Heating

Problems.

1. In how many ways are the homes in your locality heated?

2. Collect pictures showing the evolution of the process of heating the house, from the open grate to hot water.

3. Find out how much it costs to put the various kinds into a house.

4. What is the cost of running the various kinds per month?

5. What are the fuels used in your locality? What are their sources? Trace coal and wood from their sources to the heater.

6. Examine a cook stove and observe how it is constructed. Make a drawing showing how the air draws through the stove and up the chimney.

7. Close the oven damper and show how the air goes through the stove and up the chimney.

Questions.

1. If the house is heated by stoves, is there a vessel of water in the room from which evaporation takes place?

2. Have you learned to regulate the dampers and drafts to give a steady heat or a quick heat?

3. When you build a fire do you place the kindling loose enough in the empty fire box to admit of a circulation of air through the fire box to start the kindling.

4. Do you light the fire from the bottom of the fire box rather than from the top?

5. Is the fire box kept free from ashes and clinkers?

6. Is the range plain and free from ornamentation which is hard to keep clean? (A nickel strip around the edge keeps the apron clean while working over the stove.)

7. When putting in a fresh supply of fuel do you regulate the drafts and dampers to prevent the escape of gases and smoke into the room?

8. Are the soot and ashes removed regularly from the top and under part of the range?

9. When removing ashes from the stove do you carry them in the ash pan to the outside of the house to empty them?

10. Do you clean up spilled ashes before they are tracked or blown to other parts of the house?

11. Are the stoves given daily care? (The best time to blacken a stove is just before or at the time of starting the fire. Then polish the stove as it grows warm.)

References.

House Sanitation: Marion Talbot.

Bulletins: Modern Conveniences for the Farm Home. Farmers' Bulletin No. 270.

Kitchen. Agricultural College, Columbus, Ohio.

(8) Water Supply

Problems.

1. From what source is the water obtained for drinking and household purposes in your neighborhood?

2. Are there other means of obtaining a water supply besides the ones represented in your neighborhood?

3. What materials are used to line the wells in you locality? Are they lined down six feet from the top with a material that will not let in surface water?

4. Draw a sanitary well and show from where the water comes.

5. Draw a well showing how it could become polluted from barnyard, outhouse, or cesspool.

6. What materials are used to build cisterns?

7. Make a drawing showing how the water is conducted from the roof to the cistern.

8. Do the cisterns in your locality have filters for clearing the water?

9. Of what materials are the filters made? How are they made?

10. What proportion of the water of the cistern is held in the unfiltered part?

11. Examine a pump and learn how it lifts the water from the well.

Questions.

1. Is it possible for the surface water to get into your water supply and pollute it?

2. Are the wells and cisterns built with tight tops to keep out dirt, insects, and small animals?

3. Is the well located near a cesspool or privy where the drainage from that could get into the water supply, making it possible for the water to become polluted with typhoid or other disease germs?

4. Is it located near a barnyard where drainage from the yards might be washed into it?

5. Does the water in your locality contain so much mineral matter that it is difficult to cook vegetables tender?

6. Do you allow the first falling rain to wash off the roof before allowing it to enter the cistern?

Drinking Cups.

1. Is the common drinking cup used in your school or town?
2. Do you use your own drinking cup, thus making it less possible for you to get infectious diseases?

References.

Food and Sanitation: Forester and Weigley.
House Sanitation: Marion Talbot.
Bulletins: Modern Conveniences for the Farm Home. Farmers' Bulletin 270.
Water Supply, Plumbing, and Sewage Disposal for Country Homes. Agriculture Bulletin 57.

(9) Air for the House

Problems.

1. Are there special devices in your school for keeping a fresh circulating supply of air in the various rooms? Examine and find out how it is operated.
2. Draw a plan of your sleeping room, showing how you get a large amount of fresh air.

Questions.

1. Are there windows on different or opposite sides of the different rooms in your house?
2. Is there an outlet for impure and overheated air as well as an inlet for fresh air provided for in your school or home?
3. Can all the windows be lowered from the top and raised from the bottom?
4. Do you sleep with your windows open?
5. Do you watch the thermometer to know if the average temperature is from sixty-eight to seventy degrees Fahrenheit?
6. Is there enough moisture provided so that the air does not cause the skin and mucous membrane of the nose and throat to be sensitive to cold?
7. Is the air kept circulating, avoiding a feeling of depression?
8. Do you air the house every day in winter?
9. Do you keep the doors between the kitchen and other rooms closed to prevent odors from getting into the house?
10. Are the windows or transoms on different sides of the kitchen arranged to carry off odors and steam?

11. Are the clothes closets aired frequently?

12. Does your schoolroom have a fresh supply of air between each intermission, if not otherwise ventilated?

13. Do you notice an unpleasant odor in the schoolroom when you come in from out of doors?

14. Do you assist in the airing of the schoolroom between intermissions?

15. Is your schoolroom closed at night with the impure air of the day still in it?

16. If your school is in a one-room building, could you help the teacher make a window board which would deflect the air up and not directly on the pupils?

17. Do you live and sleep as much as possible out of doors where there is a good circulation of air, keeping your skin in a condition which will resist cold?

References.

House Sanitation: Marion Talbot.

Food and Sanitation: Forester and Weigley.

Bulletin: Housekeeping and Sanitation for Rural Schools. Hampton Institute, Hampton, Virginia.

(10) Removal of Wastes

Problems.

1. Find out how the wastes in your locality are disposed of.

2. Of what do these wastes consist? Are the wastes put to profitable uses?

Questions.

Kitchen Wastes or Garbage.

1. Is the garbage from the kitchen kept in a covered galvanized iron pail to prevent exposure to the sun and flies?

2. Are these pails emptied and washed out daily? When not in use do they get a sun bath?

3. Is the waste fed to the pigs or chickens or is it burned?

4. Do you have a place to keep old tin cans for the junk peddler, where the cans will not collect water and furnish a breeding place for mosquitoes and other insects?

5. Are your backyards kept free from ashes, tin cans, old iron, broken furniture, old shoes, paper, etc? Do you burn as much of this material as possible?

6. Do you keep the ashes free from organic matter—decayed vegetables, etc.—that they may be used for walks or to fill in low places?

Sewage.

1. Is the sewage from the house taken care of through a plumbing system or in the privies? If a privy is used are the flies kept away from the vault or pails by screens? Are the covers to the seats kept on?

2. Is there a pail of dry dirt or lime in the privy to be sprinkled in the pails and vaults each day?

3. Are the pails or vaults emptied often?

4. Is it emptied in a place where the sun will disinfect it soon and where the rain will not wash it into the source of water supply, yours or your neighbor's?

5. When the vaults are cleaned is the refuse taken to a field where there is no garden truck or fresh fruit grown which might become contaminated with disease germs from the wastes?

References.

House Sanitation: Marion Talbot.

Bulletin: The House Fly as a Carrier of Disease. Hampton Institute, Hampton, Virginia.

(11) Furnishing a House

Problems.

1. Find pictures of furniture in magazines or send to a furniture dealer for catalogue. Study good and bad furniture.

2. Select furniture for living room, bed room, dining room, and hall which would be substantial, appropriate for the room, and easy to clean or dust.

3. Of what woods is furniture made? How is furniture manufactured?

4. Arrange furniture on piece of paper such as you think appropriate for a living room, dining room, bed room, and hall.

(a) Furniture

1. Has the quality, durability, ease of cleaning, as well as usefulness and beauty been considered in the choice of furniture?

2. Has care been taken to avoid the overcrowding of the room with furniture?

3. Has soft wood, inexpensive furniture, well stained or good

willow and rattan which can be colored to correspond with other furnishings been chosen in preference to cheap varnished pieces?

4. Has the furniture for different rooms been chosen to harmonize with the woodwork or predominating tone of the room?

References.

Shelter and Clothing: Kinne and Cooley.
The House: Isabel Bevier.
Bulletins: Selection of Household Equipment.
Department Agriculture, Year Book 1914.
Household Furnishing.
Cornell Reading Course, Farmhouse Series No. 2.

(b) Bedroom

Problems.

1. Make a list of the things necessary to fit out a bed.

2. What does it cost to fit out a bed? Include two pairs of sheets and pillow cases.

3. Learn how to make a bed and then practice the correct way in making your own bed.

4. Make a list or find pictures of various kinds of springs. Of mattresses. Compare cost.

5. What materials are used to fill a mattress?

6. What kinds of coverings are used on a bed? Find the cost of each.

Questions.

1. In your list of things necessary to furnish a bed, were the covers chosen washable and light in weight? Are they of a material to insure good ventilation? Wool blankets or comforts are best.

2. Was the material chosen for the bedspread of some material easy to launder—a dimity, counterpane of chintz or linen with cover for pillows of the same goods?

3. When you make your bed do you place the lengthwise crease of the sheet in the center of the bed?

4. Is the sheet placed so as to make the extra turning in at the bottom and top?

5. Is the wide hem at the top and the narrow at the bottom?

6. Is the top sheet put with the wrong side of the hem to the right side of the under sheet so that when the top sheet is turned over the covers, the right side of the hem is out?

7. After the under sheet is placed on the bed is it turned under at the top and bottom, the corners mitered and turned under the sides, making the sheet smooth and free from wrinkles?

8. Is the blanket or comfort slipped down a foot from the head and the sheet turned over the edge?

9. Is it folded under the bottom, mitered at the corners, and folded under the sides the same as the sheets?

10. Is the spread put on evenly and smoothly?

11. Are the pillows laid flat at the head or bolstered against the head of the bed?

12. When you get up in the morning do you throw the covers over the foot of the bed, folding them so they do not touch the floor, and then allow the bed to air for at least a half hour before making?

References.

The Healthful Farm House: Helen Dodd.

Bulletin: Household Furnishing. Cornell Reading Course. Farmhouse Series, No. 2.

(c) Rugs

Problems.

1. Find illustrations of different kinds of rugs, including good home made rugs.

2. Of what materials are rugs made? How are they made? Compare cost.

Questions.

1. Have rugs been chosen because of ease of moving and cleaning?

2. Have plain rugs or those with two tones of the same color or small inconspicuous designs been selected?

3. Do you use rugs in your bedroom which do not show lint easily and which can be taken out and dusted frequently? (Home made rugs are good for a bedroom.)

References.

Bulletins: Selection of Household Equipment.
Household Furnishing. Cornell.

(d) Curtains

Problems.

1. Get samples of materials suitable for curtains.
2. Estimate the cost of curtains made from the various materials.

Measure a strip of the curtain material before washing. Wash strip, measure again, and estimate how much your curtains will shrink when laundered.

Questions.

1. Are the curtains of some sheer soft material, like net, dotted Swiss, or cheese cloth, rather than cheap, undesirable imitation lace?
2. Is the pattern easy to launder?
3. In estimating the length of the curtain did you make allowance for shrinkage when laundering?

References.

Shelter and Clothing: Kinne and Cooley.
Bulletin: Selection of Household Equipment, U. S. Dept. Agriculture Year Book 1914.

(e) Kitchen Utensils

Problems.

1. List different metals used to make kitchen utensils.
2. Study characteristics of different metals used for making cooking utensils.
3. Find cost of different kinds of cooking utensils.
4. Try cleaning sliver by putting a few pieces at a time into a bright tin or aluminum vessel which contains a solution of baking soda and salt—one tablespoon each to one quart of water.
5. What utensils are best adapted to the different processes of cookery? See bulletin—Choice and Care of Utensils.
6. Find different ways of cleaning utensils.

Questions.

1. What materials are best for different cooking purposes?
2. Which materials are easiest to keep clean?
3. If the tarnish was not entirely removed in the solution in the tin or aluminum vessel, did you try to brighten it with a soft cloth?

4. After studying the care of different utensils, did you try in your own home the different ways of cleaning suggested, to prove that they were really effective?

References.

Foods and Sanitation: Forester and Weigley.

Bulletin: Choice and Care of Utensils. Cornell University Reading Course, Farm House Series No. 5.

(12) Cleaning of the House

Problems.

1. Plan the steps you would take in cleaning a room, from the gathering together of materials for cleaning to the putting of the room in order.

2. After planning the work of cleaning various rooms, test your plan by actually working it out at home or by cleaning the schoolroom.

3. Make a plan for the daily care of a room.

Questions.

1. After you have planned the routine work and actually worked it out according to your plan, did you find that it assisted you in doing the work faster and easier?

2. Does the systematizing of your work leave you more time for other things you wish to do?

3. Did you find that the daily care of your room lessened the weekly care?

4. In sweeping or cleaning a room do you open the windows first?

5. In sweeping your room do you use some material to keep the dust from flying, as damp bits of paper or tea leaves?

6. When you dust a room do you use a damp cloth or prepared dust cloth which collects the dust rather than scattering it around the room to lodge in another place?

7. Do you dust the walls and woodwork frequently?

8. Do you dust the walls before you sweep the floor?

9. Do you take down the pictures, or if not taken down, do you cover them before brushing the walls or ceiling?

10. Do you clean and dry your cleansing utensils before putting them away in a cleaning closet or the regular place for keeping them?

11. Is your schoolroom floor kept oiled to prevent the flying of dust when sweeping?

12. Do you air your bedroom daily?

13. Do you air and make your bed at a regular time each day?

14. Do you dust your bedroom frequently, keeping it sweet and tidy?

15. When you remove your clothes at night do you hang them up or smooth them out so that they are not wrinkled, but well aired, and easy to get into in the morning?

16. Do you put the dining room in order after each meal?

17. Do you remove the tablecloth between meals?

18. Do you remove all the dishes containing food to the cupboard or ice chest?

19. Do you thoroughly scrape the dishes and stack them before beginning to wash?

20. Do you put dishes which have contained egg, dough, etc., to soak in cold water and dishes in which there has been syrup or fats in hot water?

21. Are the cooking utensils used for cooking put to soak in water as soon as food is removed from them?

22. Do you thoroughly wash and rinse the dishcloth after each washing of dishes?

23. Do you rinse out the dish towels and hang them up to dry after wiping the dishes?

25. Are you careful in cleaning your enamel sink not to use a gritty material or a substance which contains much acid or strong alkali which would injure the enamel?

26. Do you give the ice box a thorough cleaning at least once a week, removing the ice and all the food and washing out the box and drain with hot water and soda or ammonia water?

27. Is the bread box or jar washed out twice a week, dried and sunned before putting in more bread?

28. Are the foods put back into the ice chest or cupboard on clean dishes? If in the cupboard is the food covered?

29. If food should mold, are you careful in disposing of it to prevent the scattering of the mold spores around the room to lodge on some other food, thus molding it?

30. Do you give the same attention to cleaning the cellar you do to other rooms in the house?

31. Is it kept free from decaying vegetation?

32. Is it kept dry and well aired, preventing the growth of molds on shelves and food?

33. Are the wash basins, stool, and bath tub cleaned daily?

34. Do you use the same precautions in cleaning the enamel of the bath room you do in cleaning the sink in the kitchen?

35. Is the material in the stool porcelain or enamel? If it is porcelain it may be cleaned with an acid—dilute hydrochloric.

36. Do you rinse the basin and bath tub after using them?

37. Do you keep a small bottle of kerosene in the bath room and near the kitchen sink to clean the enamel?

38. Are there cleaning utensils, clothes, and brushes kept in a convenient place for cleaning the bath room?

39. If there is no bath room, are the wash bowl and pitcher kept clean? Kerosene may be used for this also.

40. Do you hang your wash cloth up to dry after using?

41. Do you fold your towel and hang it up?

42. Do you keep the slop jar emptied and aired each day?

References.

Foods and Sanitation: Forester and Weigley.

Care of the House: T. M. Clark.

Bulletins: Rules for Cleaning. Cornell Reading Courses, Farm House Series, No. 4.

Housekeeping and Sanitation for Rural Schools. Hampton Institute, Hampton, Virginia.

(13) Household Pests and Their Prevention

Problems.

1. Study the life history of the fly. See *Household Insects and Methods of Control.*

2. Study the life history of the mosquito.

3. Study the life history of the bed bug.

4. Study the life history of the household ant.

5. Study the life history of the clothes moth.

Questions.

1. Do you apply the knowledge, when necessary, that you learn concerning flies, mosquitoes, bed bugs, ants, and clothes moths to the control of such in your home?

References.

Bulletins: Household Insects and Methods of Control. Cornell Reading Courses, Sanitation Series, No. 3.

The House Fly as a Carrier of Disease. Hampton Institute, Hampton, Virginia.

(14) The Cleaning of Clothes

Problems.

1. Suggest ways in which soiled clothes may be dangerous to health.
2. Make a list of necessities for a home laundry and estimate cost.
3. Draw plan for laundry and show where stove, tubs, etc., should be placed for greatest convenience.
4. List labor-saving devices which might be desirable.
5. Review work in textiles on the nature of the cotton, linen, woollen, and silk fibers?
6. List common household alkalies and acids.
7. Name soaps in most common use and find out how soap is made.
8. List some of the kinds of blueing on the market. Get samples if possible.
9. List methods of removing common stains, grass, coffee, tea, cocoa, iron rust, mud, etc.
10. List ways of making starch.
11. Give the order in which clothes should be laundered. Give reasons.
12. Find out approved methods and order of ironing and folding clothes.

Questions.

1. What effect have acids and alkalies upon the various fibers?
2. What care then, should be taken of the laundering of these different fabrics?
3. When using hard water do you use enough soap or washing powders to dissolve the precipitate, thus preventing the clothes from feeling gummy or looking as if they had not been washed?
4. What alkalies did you find that softened the water?
5. Did you thoroughly mix and cook the starch, preventing it from lumping and making it easy to iron without the starch sticking to the iron?
6. Try the samples of blueing obtained and determine which give the best results.
7. Try to remove some of the common stains according to the methods studied.
8. Wash, iron and fold at home one starched piece and bring to the teacher for approval.

References.

Approved Methods for Home Laundering: Proctor and Gamble.
Shelter and Clothing: Kinne and Cooley.
Home Laundry Hints: Luther Ford & Co.

(15) Household Accounts

Problems.

1. Keep an itemized account of the expenses of a home, including food, clothing, fuel, light, expense for school, church, entertainments, etc. If food is raised in the garden or on the farm estimate it in your account at market price. If your mother makes the clothing estimate the cost of making.

2. At the end of the month balance up the different items as groceries, meat, milk, light, etc.

3. Repeat problems one and two.

4. Keep an itemized account of the money spent for your clothing, school, pleasures, church, charity, etc., for a number of months. At the end of a certain time estimate the total cost of each division.

Questions.

1. After keeping the household account for a certain period can you tell about what it costs to maintain a family in your locality?

2. If you had a certain sum of money to spend, would the keeping of personal accounts assist you in spending the money to the best advantage?

3. In looking over your accounts do you see where you could have managed and have had more benefit from the money spent?

4. Did you get your money's worth in all your expenditures, or did you find you spent too much for one item and not enough for another?

References.

Food and Household Management: Kinne and Cooley.
Household Accounting Series: A. N. Palmer, Chicago.

b. SPECIAL BIBLIOGRAPHY FOR A STUDY OF THE PLANNING, BUILDING, CARE AND FURNISHING OF A HOUSE

Books

Bevier, Isabel. *The House, Its Plan, Decoration and Care.* American School of Home Economics, Chicago. 1907. $1.50.

Clark, Theodora M. *The Care of a House.* Macmillan Company, Chicago. 1903. $1.50.

Dodd, Helen. *Healthful Farmhouse.* Whitcomb & Barrows, Boston. 1908. 60c.

Forester and **Wrigley.** *Food and Sanitation.*

Kinne and **Cooley.** *Shelter and Clothing.* Macmillan Company, Chicago. 1913. $1.10.

Kinne and **Cooley.** *Foods and Household Management.* Macmillan Company, Chicago. 1914. $1.10.

Palmer, A. W. *Household Accounting Series.* A. W. Palmer Pub. Co., Wabash Ave., Chicago.

Quinn, Mary Josephine. *Planning and Furnishing the Home.* Harper & Bros., New York. 1914. $1.00.

Talbot, Marion. *House Sanitation.* Whitcomb & Barrows, Boston. 1912. 80c.

White, Chas. Elmer. *Successful Houses and How to Build Them.* Drawings by the author. Macmillan Company, Chicago. 1912. $2.00.

Bulletins

Modern Conveniences for the Farm Home. *Bulletin No. 270.* U. S. Department of Agriculture, Washington, D. C. 1915. Free.

Water Supply, Plumbing and Sewage Disposal for Country Home. *Bulletin No. 57.* U. S. Department of Agriculture, Washington, D. C. Free.

Selection of Household Equipment. *Department of Agriculture Year Book.* U. S. Department of Agriculture, Washington, D. C. 1914.

Household Decoration. *Cornell Reading Courses, Farm House Series No. 1.* Cornell University, Ithaca, N. Y.

Household Furnishing. *Cornell Reading Courses, Farm House Series No. 2.* Cornell University, Ithaca, N. Y.

Household Insects and Methods of Controlling Them. *Cornell Reading Courses, Sanitation Series No. 3.* Cornell University, Ithaca, N. Y.

Rules for Cleaning. *Cornell Reading Courses, Farm House Series No. 4.* Cornell University, Ithaca, N. Y.

Choice and Care of Utensils. *Cornell Reading Courses, Farm House Series No. 5.* Cornell University, Ithaca, N. Y.

The Farm and House. *Cornell Reading Courses, Farm House Series No. 6.* Cornell University, Ithaca, N. Y.

Cooking Lessons for Rural Communities. *Hampton Institute,* Hampton, Va.

The House Fly as a Carrier of Disease. *Hampton Institute,* Hampton, Va.

Housekeeping Sanitation for Rural Schools. *Hampton Institute,* Hampton, Va.

Kitchens. *Agricultural College Extension Bulletin.* Columbus, Ohio.

Planning and Equipping the Kitchen. *Iowa State College, Agricultural Extension Department,* Ames, Iowa. 1915-16.

The Laundry. *Cornell Reading Course, Farm Series No. 3.* Cornell University, Ithaca, N. Y.

Methods of Laundry Work. *Proctor & Gamble,* Cincinnati, Ohio.

Home Laundry Hints. *Luther Ford & Co.,* Minneapolis, Minn.

C. COURSE OF STUDY IN DOMESTIC SCIENCE FOR THE HIGH SCHOOL

1. AIM AND SCOPE OF THE WORK

As already pointed out (See Introduction, pp. 7-13 above), the aim of the domestic science work is two-fold: (a) It should give young people a more intelligent appreciation for the occupation of home-making, and (b) It should, so far as possible, prepare them for efficient and economic work in the home. The occupation of home-making should be very carefully analyzed by the teacher to see what kind and amount of instruction is needed to fit young people for this line of service. The course should then be planned with a view of giving the kind of help that is needed to attain this result. There are five more or less distinct groups of problems with which the home-maker must deal: (1) The problem of providing and preparing proper food. (2) The problem of making and taking care of clothing. (3) The care and upkeep of the

home. (4) The management or administration of the home. (5) The problem of making the home beautiful and attractive. Domestic science can not be successfully taught as a single subject. Better results will be attained if the teacher will take up one of the fields of work indicated above and dwell on that group of problems until they have been mastered before another department of the work is taken up.

No detailed course for the high school embodying all the principles and suggestions given in the introduction to this course of study has as yet been made out. The following outlines, together with the suggestions and helps given above must be taken as a guide until such time as a complete course of study properly articulated to the work done in the grades can be prepared. *Teachers should read carefully the introduction to this State course of study before she plans or outlines her work.*

2. Amount of Work to Be Done

All commissioned and certified high schools must provide at least a full year's work in domestic science. City schools and as many others as can do so should arrange to provide three or more years' work in domestic science, so that the girls desiring to fit themselves in the high school for the occupation of home-making would be given an opportunity to do so.

3. Library and Laboratory Equipment Needed

For official and required lists of library and laboratory equipment for the domestic science work in commissioned and certified high schools see Section D, pp. 114-124 below.

4. Outline for a Course in Cooking and the Study of Foods

a. Recitation work.

1. The model kitchen.
2. Methods of cooking, with definitions.
3. Methods of cleaning a kitchen.
4. Food and its uses to the body.
5. Carbohydrate foods.
6. Protein foods.
7. Planning a meal.
8. Serving a meal.
9. Salads and desserts.

10. Breads and bread-making.
11. The use of left-overs.
12. Furnishing a dining room.
13. The care of the dining room.
14. The duties of a hostess.

b. Laboratory exercises.

1. Discussion of cooking utensils.
2. Canned fruits, preserves and jellies.
3. Cooking of vegetables.
4. Meats and their cookery.
5. Quick breads.
6. Yeast breads.
7. Salads.
8. Cakes.
9. Desserts.
10. Planning and serving a breakfast.
11. Planning and serving a dinner.
12. Refreshments to be used for parties.

5. OUTLINE FOR A COURSE IN SEWING AND THE STUDY OF TEXTILES

a. Recitation work.

1. The work basket.
2. Definitions used in textile work.
3. Cotton—its history and manufacture.
4. A study of cotton materials.
5. Linen—its history and manufacture.
6. A study of linen materials.
7. Wool—its history and manufacture.
8. A study of wool materials.
9. Silk—its history and manufacture.
10. A study of silk materials.
11. Rules for buying materials.
12. Textile adulterations with tests for adulterations.
13. Buying table linen.
14. A discussion of carpets.
15. Materials suitable for draperies in house furnishings.

b. Laboratory exercises.

1. Basting, hemming and running on simple garments and models.
2. Seams.

3. Mending and darning.
4. Patching.
5. Use of sewing machine.
6. Cutting and making of simple undergarments and wash dresses.

6. Suggestions for Course in Laundry Science

a. Recitation work.

1. Reasons for washing clothes.
2. Equipment for laundry work.
3. Preparation of water.
4. Soap—kinds and uses.
5. Starch—making and use.
6. Washing flannels.
7. Laundering colored clothes.
8. Laundering table linen.
9. Laundering doilies and laces.
10. Ironing.
11. Folding ironed clothes.
12. Care of laundered clothes.

b. Laboratory work.

Any place where laboratory work is possible it is a good thing to have demonstrations in methods of doing this work. Under other conditions the girl might do some of the work at home and bring it in for examination.

7. Outline for a Study of the Care of the Home, Home Sanitation and Home Hygiene

a. Recitation work.

1. Dirt and its dangers.
2. Personal hygiene.
   a. Care of teeth.
   b. Care of nails.
   c. Care of skin.
   d. Care of hair.
3. Using the body correctly.
4. Clothes in relation to health.
5. Fresh air and its relation to health.
6. Contagious disease and its meaning.
7. Laws governing quarantine.

8. Emergencies.
9. Rules for the sick room.
10. Preparing the invalid's tray.
11. Impure water and its dangers.

8. OUTLINE FOR A COURSE IN THE PLANNING AND FURNISHING OF THE HOME

a. Recitation work.

1. House plans.
2. Yards and gardens.
3. Kinds of building material and their uses.
4. Wall paper, paints, and stains.
5. Carpets and rugs.
6. Draperies.
7. Buying furniture.
8. Furnishings for the living room.
9. Furnishings for the bed room.
10. Care of bedding.
11. General rules for cleaning a house.
12. Entertaining in the home.

b. Laboratory work.

Make collections of wall papers, carpet samples and curtain materials. Booklets may be made in which are placed pictures of both good and poor types of furniture. Compositions should be written describing each room and its furnishings.

Trips to a furniture store will make the work more interesting.

D. LIBRARY AND LABORATORY EQUIPMENT NEEDED FOR DOMESTIC SCIENCE WORK

1. LIBRARY HELPS NEEDED FOR WORK IN RURAL SCHOOLS

The following reference books and library helps are needed by pupils and teachers in rural and town schools. The list on the particular topic taken up in the township or school should be supplied by the Trustee. There are many other good books besides those noted, but the following list will probably be as helpful for the teachers and pupils as any that can at present be procured. If all the books on the particular subject studied can not be purchased in one year, half might be purchased one year and half

the next. The boys and some local carpenter could make a case for the books where they might safely be kept. Some schools, by giving entertainments, have made enough money to buy a good library and all the equipment needed for the demonstration and practice work undertaken. This may be done wherever absolutely necessary. It is expected, however, that the Trustee will provide all needed equipment.

a. COOKING

Helpful Texts

Austin, Bertha J. *Domestic Science Book 1 and 2.* Lyons & Carnahan, Chicago, Ill. 1914. 60c.

Farmer, Fanny M. *Boston Cooking School Cook Book.* Whitcomb & Barrows, Boston, Mass. 1906. $2.00.

Hill, Janet M. *Practical Cooking and Serving.* Whitcomb & Barrows, Boston, Mass. 1912. $1.50.

Hill, Janet M. *Up to Date Waitress.* Whitcomb & Barrows, Boston, Mass. 1906. $1.50.

Longworthy, C. F. *Food Charts Showing Comparison of Food Materials.* U. S. Department of Agriculture, Washington, D. C. $1.00.

Kinne & Cooley. *Foods and Household Management.* Macmillan Company, Chicago, Ill. 1914. $1.10. (Good reference for teachers.)

Richards, Ellen H. *First Lessons in Food and Diet.* Whitcomb & Barrows, Boston, Mass. 1914. 30c.

Williams & Fisher. *Elements of the Theory and Practice of Cookery.* Macmillan Company, Chicago, Ill. 1911. $1.00.

Farmers Bulletins

The following bulletins may be obtained free for school libraries from the U. S. Department of Agriculture, Washington, D. C., until the first supply has been exhausted, then for 5c per copy:

No. 142—Principles of Nutrition and Nutritive Value of Food.
No. 175—Care of Food in the Home.
No. 270—Modern Convenience for Farm Home.
No. 43—Sewage Disposal on the Farm.
No. 345—Some Common Disinfectants.
No. 459—House Flies.
No. 565—Corn Meal as a Food and Ways of Using It.
No. 389—Bread and Bread Making.

No. 249—Cereal Breakfast Foods.
No. 121—Beans, Peas and Other Legumes as Food.
No. 413—Care of Milk and Its Uses in the Home.
No. 363—The Use of Milk as a Food.
No. 34—Meats, Composition and Cooking.
No. 391—Economical Use of Meat in the Home.
No. 526—Mutton and Its Value in the Diet.
No. 487—Cheese and Its Economical Uses in the Diet.
No. 128—Eggs and Their Uses as Food.
No. 521—Canning Tomatoes at Home and in Club Work.
No. 359—Canning Vegetables in the Home.
No. 293—Use of Fruit as a Food.
No. 256—Preparation of Vegetables for the Table.
No. 28—Composition of American Food Materials.
No. 203—Canned Fruits, Preserves and Jellies.
No. 342—A Model Kitchen.

b. SEWING

Helpful Texts

Gibbs, Charlotte. *Household Textiles.* Whitcomb & Barrows, Boston, Mass. 1912. $1.25.

Kinne & Cooley. *Shelter and Clothing.* Macmillan Company Chicago, Ill. 1913. $1.10.

Woolman, Mary S. *Sewing Course for Schools.* Whitcomb & Barrows, Boston, Mass. 1908. $1.50.

Woolman & McGowan. *Textiles.* Whitcomb & Barrows, Boston, Mass. 1913. $2.00.

Farmers Bulletins

No. 185—Beautifying the Home Grounds.
No. 270—Modern Home Conveniences on the Farm.
No. 274—Flax Culture.
No. 302—Sea Island Cotton.
No. 601—New Method of Cotton Culture.

c. LAUNDRY

Balderston & Limrick. *Laundry Manual.* Whitcomb & Barrows, Boston, Mass. 1909. 54c.

Cornell University. *The Laundry.* Bulletin Cornell University, Ithaca, N. Y.

Proctor & Gamble. *The Laundry.* Proctor & Gamble, Cincinnati, Ohio. (Free.)

Sheppard, J. L. *Laundry Work.* Whitcomb & Barrows. 1909. 60c.

d. SANITATION AND HYGIENE

Dodd, Helen. *Healthful Farmhouses.* Whitcomb & Barrows, Boston, Mass. 1908. 60c.

Richards, E. H. *Cost of Shelter* and *Cost of Cleanliness.* Whitcomb & Barrows, Boston, Mass. 1904. $1.00 each.

Talbot, Marion. *House Sanitation.* Whitcomb & Barrows, Boston, Mass. 80c.

e. CARE, MANAGEMENT AND BEAUTIFICATION OF HOME

Bevier, Isabel. *The House. Its Plan, Decoration and Care.* American School of Home Economics, Chicago, Ill. 1907. $1.50.

Clark, Theodora M. *Care of a House.* The Macmillan Company, Chicago, Ill. 1903. $1.50.

Daniels, F. H. *Furnishing a Modest Home.* Whitcomb & Barrows, Boston, Mass. 1908. $1.00.

See also special list of Bulletins and books helpful for a study of planning, care and furnishing of the House, pp. 103 and 104 above.

2. LABORATORY EQUIPMENT REQUIRED FOR DOMESTIC SCIENCE WORK IN RURAL SCHOOLS

Three lines of domestic science work may profitably be undertaken in a Rural school. (1) A study of the care, decoration, planning and sanitation of the home. (2) A study of textiles and practice work in sewing. (3) The experimental study of foods or demonstration and practice work in cooking.

a. STUDY OF PLANNING, CARE, UPKEEP AND MANAGEMENT OF HOME

For a study of the home, its plan and care, home sanitation, etc., no equipment, aside from the books and bulletins listed above for this subject, is required.

b. STUDY OF TEXTILES AND PRACTICE WORK IN SEWING

A study of clothing and practice work in sewing may be undertaken where the teacher is qualified to give the instruction and

where there is space for the class work. The necessary equipment for this work in sewing can be purchased for $8.25—as follows:

1. A board top kitchen table.....$1.25

2. Cupboard space to keep the pupils' work is necessary. Shelves and pasteboard boxes may serve the purpose, but it would be better to build a case for the books and materials used.

3. Each girl should furnish scissors, a thimble, a paper of needles (6-10) and a private sewing bag.

4. The books and bulletins listed above for the study of sewing should be provided for the use of the pupil and teacher. These will cost $7.00.

c. STUDY OF FOODS AND COOKING

Two sorts of work in cooking may be done. (1) An experimental study of foods and their preparation at school, followed by practice work at home along the lines of study taken up in the school. (2) Demonstration and practice work in cooking. The former can be done in any rural school if the teacher is interested and has had some training, or will work out the problem for herself. *Practice work can not be successfully done unless a separate room or compartment can be fitted up for the cooking.*

(1) Equipment Needed for Experimental Study of Foods. For the experimental study of foods the following equipment is needed:

1. A stove or alcohol burner. If a heater has already been installed a small stove might be placed near the other stove and connected with the same chimney. Where this can not be done the regular stove or an oil or alcohol burner must be used for the experimental work, and only such lessons and work should be undertaken as can be successfully carried on with this equipment. An oil or alcohol burner can be purchased for about 25c. The necessary test tubes and other materials required for experiments may be secured as needed. The entire cost for this type of work need not exceed $10.00 for the school term.

2. A home-made fireless cooker or hay box may be made by the teacher and boys. See Farmers Bulletin No. 296, U. S. Department of Agriculture, Washington, D. C.

3. The bulletins and books listed above, or as many of them as it is possible to buy, should be purchased for the school library. The entire list only costs $8.90.

4. A wooden cabinet with shelves to hold the utensils used

for demonstration or practice work in cooking should be provided. The back of this cabinet should be solid to exclude dust, and there should be a door and enough shelves and space for the equipment purchased. This can be made by the teacher and the boys. If made by a carpenter it would cost about $7.00.

(2) Equipment for Practice Work in Cooking. For practice or demonstration work in cooking a separate room or compartment should be provided, and the teacher must be qualified to give the instruction. Some rural schools have fitted up an annex for this work. The necessary equipment for practice work in cooking can be purchased for $10.00 to $12.00 and should consist of the following:

1 Oil stove.
1 Oven for stove.
1 Work table.[1]
1 Stew kettle.
1 Double boiler.
1 Glass measuring cup.
4 Table spoons.
6 Tea spoons.
1 Spatula.
1 Metal knife.
6 Knives and forks.
2 Metal forks.
2 Pint mixing bowls.
1 Bread bowl (2 qts.).
1 Drinking glass.
2 Plates, 6-inch.
4 Thick white plates.
6 White cups and saucers.
1 Wooden spoon.
1 Pie pan.
1 Frying pan.
1 Tin lid.
2 Dish pans.
1 Rolling pin.
2 Paring knives.
1 Dover egg beater.
1 Wash basin.

[1] A box may be secured which will serve both for a table and place for storing the materials and utensils.

1 Flour sifter.
1 Soap dish.
1 Garbage pail with tight cover.

3. LABORATORY EQUIPMENT NEEDED FOR DOMESTIC SCIENCE WORK IN TOWN AND CITY SCHOOLS

a. NECESSARY ROOMS AND EQUIPMENT FOR SEWING

1. There should be a separate room, well ventilated and lighted (not in basement) and fitted up with suitable tables, chairs, cases for materials and first class sewing machines. When this can not be done sewing tables and chairs should be placed in a suitable recitation room adapted to the sewing work.

2. There should be one machine to each four girls in the class.

3. There should be enough drafting and sewing tables to accommodate the class. These tables should be 3x6 or 7 ft. long and 30 inches high. They should be made, or purchased, so they will fit into the room.[1]

4. The sewing room should also be provided with individual lockers about 9 inches high, 15 inches wide and 24 inches deep, with hinged doors and locks, built 8 lockers high. Instead of these lockers pasteboard boxes for taking care of the students' work between classes may be used and stored on shelves. These lockers or shelves can in most cases be made by the boys in the woodworking class.

5. There should also be a fitting room provided with a mirror for the dressmaking class, or one corner of the room, about 6x10 ft., curtained off for the purpose.

6. A small sink for water supply is desirable and an ironing board, irons and the means of heating the irons is necessary.

7. There should be a teachers' cabinet for materials. This, too, might be made by the woodworking class.

8. Each girl should provide herself with an individual equipment, consisting of scissors, thimble, tape, emery ball, needles (6-10) and a private sewing bag or box.

9. There should be one pair of cutting shears.

10. There must be enough individual straight-backed chairs of the right heights to accommodate the class.

11. The sewing room must be well lighted and ventilated, and

[1] For suggestions and plans for arranging tables, machines, display cases, etc., in the sewing room, apply to Vocational Division, Department of Public Instruction, Indianapolis.

should be provided with artificial light for dark days. If a separate room can not be provided a regular class room may be fitted up with tables and the necessary equipment, or better still, a modern house or flat, convenient to the school, may be rented for all the domestic science work.

The total cost of equipment for sewing will, of course, depend upon the size of the classes to be accommodated and upon the type of equipment purchased. The total cost of the cheapest equipment for individual work in sewing for a class of 16 would be about $150.00. The medium priced equipment would cost about $357.00. Expensive equipment would cost $600.00.

The following is a complete list of equipment needed in sewing for a class of sixteen:

	Cheap.	Medium.	Expensive.
4 Sewing machines (each)	$12 00	$25 00	$45 00
1 Mirror	7 50	10 00	20 00
1 Ironing board	1 50	1 50	3 00
2 Irons for pressing (each)	25	60	3 00
1 Cabinet for materials	25 00	35 00	57 00
8 Sewing tables (each)	6 00	18 00	30 00
16 Straight-backed chairs (each)	1 00	3 00	4 00
1 Cutting shears	50	75	1 20
1 Students' storage case	(Pasteboard boxes)	7 50	16 00
1 Cutting table	4 00	10 00	16 00
Total	$151 00	$357 75	$603 20

b. NECESSARY ROOMS AND EQUIPMENT FOR COOKING

Equipment for instruction in cooking may be very cheap, of medium cost or expensive. There can be no question but that good equipment, wisely purchased, is most economical, but it is better to start the work with the cheaper equipment than to delay its introduction.

The cheapest desk is the kitchen table; the other types of desks are made to order according to designs which may be planned by the teacher and school authorities and are usually purchased from commercial concerns.

Cupboards for holding extra utensils are necessary, unless there is ample closet space. These may consist of rough board shelves or finely polished cabinets.

Where possible, a small gas or coal oil hot plate and individual ovens should be supplied to each pupil. A large range is desirable,

though not absolutely required to begin the work. Even where there is great need of economy, each student should have some means of cooking at her desk. A bunsen burner, a tripod, a piece of wire gauze and rubber tubing can all be purchased for 35 cents, and with these it is possible to do much cooking. Of course, a range with an oven would be necessary under these conditions.

The total cost of the cheapest equipment for individual work for a class of 16 to 20 would be about $105.00. The medium priced equipment would approximate $360.00 in cost. The expensive would cost from $570.00 to $650.00.

(1) General Equipment for Cooking

	Cheap.	Medium.	Expensive.
1 Range	$25 00	$45 00	$65 00
Cupboards for supplies and equip...	3 00	20 00	50 00
1 to 4 Sinks (each)	3 50	8 50	40 00
1 Supply table	1 25	2 50	10 00
1 Refrigerator	9 00	25 00	40 00
1 Window box for cold storage	To be made by the boys		
6 Supply cans	15	50	50
8 Jars for supplies	06	22	22
4 Large mixing bowls 9″ to 11″	25	40	40
2 Large stew kettles 12″ to 14″	40	75	1 40
1 Frying pan and wire basket for same	10	10	10
1 Bread knife	45	45	1 00
2 Extra paring knives	10	15	15
1 Medium coffee pot	35	75	1 25
1 Tea pot	35	75	1 25
1 Roaster	1 25	1 25	1 25
4 Pie tins (large)	05	05	25
4 Bread pans (large)	10	25	50
1 Steamer	75	75	75
1 Meat grinder	60	1 25	1 50
2 Chopping bowls and knives	50	50	50
1 Large pitcher	35	35	1 00
1 Garbage can	25	1 00	1 50
1 Flour sifter	10	10	10
1 Can opener	10	10	15
1 Lemon squeezer	10	10	50
1 Butcher knife	45	75	1 25

	Cheap.	Medium.	Expensive.
1 Large earthen baking dish	$0 25	$1 00	$2 50
1 Broom	25	50	75
1 Dust pan	10	20	25
1 Ice cream freezer (desirable)	..	1 75	1 75

(2) Group Equipment

(ONE SET FOR EACH TWO GIRLS)

1 Work table (2 spaces)	$1 25	$16 00	$25 00
1 Oven	..	1 50	2 75
1 Dover egg beater	10	10	10
1 Grater	05	10	10
1 Cake pan (individual)	05	10	20
1 Puree seive	..	06	06
1 2½″ Cruller cutter	02	05	05
1 Gem tin (4 muffins)	05	10	20
1 Double boiler	50	75	75
1 Each, salt and pepper shakers	..	10	25
1 Scrubbing brush	03	03	03
1 Soap dish	05	15	35
1 Match box	05	15	25
1 Bread board	25	Comes with desks	

(3) Individual Equipment

(ONE SET FOR EACH GIRL IN CLASS)

	Cheap.	Medium.	Expensive.
1 Individual hot plate	$ 35	$1 00	$1 50
1 Utility plate	05	10	25
1 Dish pan (2 gallons)	20	20	35
1 Pt. tin (small)	05	05	05
1 Loaf bread pan (small)	05	10	10
1 Sauce pan 1-1½ qts. (enameled)	15	20	50
1 Rolling pin	10	25	25
1 Asbestos mat	03	05	05
1 Dinner plate	05	15	15
1 Wooden spoon	05	12	12
1 Cup and saucer	10	25	25
1 Standard measuring cup (glass)	05	15	15
1 Knife and fork	10	25	25
1 Spatula	25	45	45
2 Tea spoons	01	10	10

	Cheap.	Medium.	Expensive.
1 Table spoon	$0 10	$0 15	$0 15
1 Silver knife and fork (desirable for serving)	20	20	50
2 White bowls (5″ and 9″) (each)	08	08	08
1 Mixing bowl	12	30	40
1 Drinking glass (desirable)	02	05	10
1 Iron frying pan	10	20	20
1 Earthen baking dish	05	10	10
1 Individual hand towel	(May be provided by pupil)		
2 Dish towels	(May be provided by pupil)		
1 Stool	75	75	75

Stools, tables, plumbing, artificial light, blackboards, china, etc., must be selected to conform with local conditions. Hot water is very necessary. Serving lessons necessitates dining table, chairs, linen. The arrangement of desks and furniture depends upon the size and lighting of the room.

4. LIBRARY HELPS FOR DOMESTIC SCIENCE WORK IN TOWN AND CITY SCHOOLS

a. COOKING

Austin, Bertha J. *Domestic Science.* Lyons & Carnahan, Chicago, Ill. 1914. $1.10.

Bailey, Edgar H. S. *Source of Chemistry and Use of Food Products.* P. Blackiston & Co., Philadelphia, Pa. 1914. $1.60.

Barrows, Anna. *Principles of Cookery.* American School of Home Economics, Chicago, Ill. 1910. $1.25.

Bevier, Isabel, Van Metey, A. R. *Selection and Preparation of Foods.* Laboratory Guide, Whitcomb & Barrows. Boston, Mass. 1910. 75c.

Farmer, Fannie M. *Boston Cooking School Cook Book.* Little, Brown & Co., Boston, Mass. 1906. $2.00.

Hill, Janet M. *Practical Cooking and Serving.* Doubleday, Page & Co., New York, N. Y. 1902. $2.00.

Hill, Janet M. *Up to Date Waitress.* Little, Brown & Co., Boston, Mass. 1906. $1.50.

Hutchinson, Robert. *Food and Dietetics.* William Wood & Co., New York, N. Y. $3.50.

Kinne & Cooley. *Foods and Household Management.* Macmillan Company, Chicago, Ill. 1914. $1.10.

Longworthy, C. F. *Food Charts Showing Comparison of Food Materials.* U. S. Department of Agriculture, Washington, D. C. $1.00.

Norton, Alice P. *Food and Dietetics.* American School of Home Economics. 1907. $1.50.

Richards, Ellen H. *First Lessons in Food and Diet.* Whitcomb & Barrows, Boston, Mass. 1904. 30c.

Sherman, Henry C. *Food Products.* The Macmillan Co., Chicago, Ill. 1914. $2.50.

Snyder, Harry. *Human Foods.* The Macmillan Co., Chicago, Ill. 1908. $1.25.

William, M. E., Fisher, K. R. *Elements of the Theory and Practice of Cookery.* Whitcomb & Barrows, Boston, Mass. 1901. $1.00. Postage, 10c.

Wilson, L. L. W. *Handbook of Domestic Science and Arts.* The Macmillan Co., Chicago, Ill. 1910. $1.00.

Register of Foods. Shows by colors the elementary principles of over 100 foods—13½ x 19". Whitcomb & Barrows, Boston, Mass. $1.00.

b. CARE, MANAGEMENT AND BEAUTIFICATION OF THE HOME

Bevier, Isabel. *The House, Its Plan, Decoration and Care.* American School of Home Economics, Chicago, Ill. 1907. $1.50.

Clark, Theodora M. *Care of a House.* The Macmillan Company, Chicago, Ill. 1903. $1.50.

Daniels, F. H. *Furnishing a Modest Home.* Whitcomb & Barrows, Boston, Mass. 1908. $1.00.

Frederick, C. *The New Housekeeping.* Doubleday, Page & Co., Garden City, N. Y. 1913. $1.60.

Irwin, Mary J. *Planning and Furnishing the Home.* Harper & Bros., New York, N. Y. 1914. $1.00.

Terrell, Bertha M. *Household Management.* American School of Home Economics, Chicago, Ill. 1897. $1.25.

See also special list of books and bulletins on this subject. pp. 103-104 above.

c. TEXTILES AND SEWING

Cooley, Anna M. *Domestic Art in Women's Education.* Charles Scribners' Sons, Chicago, Ill. 1911. $1.25.

Dooley, Wm. H. *Textiles.* D. C. Heath & Co., Chicago, Ill. 1910. $1.00.

Gibbs, Charlotte M. *Household Textiles.* Whitcomb & Barrows, Boston, Mass. 1912. $1.25.

Kinne and **Cooley.** *Shelter and Clothing.* Macmillan Company, Chicago, Ill. 1913. $1.10.

Osburne, Leno. *Food and Clothing.* Row, Peterson & Co., Chicago, Ill. 1914. 60c.

Watson, Kate H. *Textiles and Clothing.* American School of Home Economics, Chicago, Ill. $1.25.

Woolman, Mary S. *Textiles.* The Macmillan Co., Chicago, Ill. 1913. $2.00.

Woolman, Mary S. *Sewing Course for Schools.* Whitcomb & Barrows, Boston, Mass. 1908. $1.50.

Woolman and **McGowan.** *Textiles.* Whitcomb & Barrows, Boston, Mass. 1913. $2.00.

Zipser, Julius. *Textiles—Raw Materials and Their Conversion into Yarn.* D. Van Nostrand Co., New York, N. Y. $5.00.

d. LAUNDRY

Balderston & Limrick. *Laundry Manual.* Whitcomb & Barrows, Boston, Mass. 1906. 50c. Postage, .04c.

Proctor & Gamble. *Laundry Manual.* Proctor & Gamble, Cincinnati, Ohio. Free.

Sheppard, J. L. *Laundry Work.* Webb Publishing Co., St. Paul, Minn. 1909. 60c.

————. *The Laundry.* Cornell University Bulletin, Ithaca, N. Y.

c. SANITATION AND HYGIENE

Bailey, E. H. B. *Sanitary and Applied Chemistry.* Whitcomb & Barrows, Boston, Mass. 1902. $1.00.

Conn, H. W. *Bacteria, Yeasts and Molds.* Ginn & Co., Chicago, Ill. 1903. $1.00.

Dodd, Margaret E. *Chemistry of the Household.* American School of Home Economics, Chicago, Ill. 1907. $1.50.

Dodd, Helen. *Healthful Farmhouses.* Whitcomb & Barrows, Boston, Mass. 1908. 60c.

Elliott, S. Marie. *Household Bacteriology.* American School of Home Economics. 1907. $1.50.

Elliott, S. Marie. *Household Hygiene.* American School of Home Economics, Chicago, Ill. 1907. $1.50.

Pyle, Walter L. *Manual of Personal Hygiene.* Whitcomb & Barrows, Boston, Mass. $1.50.

Sherman, Henry C. *Chemistry of Food and Nutrition.* Macmillan Company, Chicago, Ill. 1911. $1.50 (advanced work).

Talbot, Marion. *House Sanitation.* Whitcomb & Barrows. Boston, Mass. 1912. 80c.

f. DOMESTIC SCIENCE BULLETINS

The following desirable bulletins may be secured for the school library at five cents each by writing to your Senator or Representative in Congress, or to the Secretary of the U. S. Department of Agriculture, Washington, D. C.

(1) Farmers Bulletins

No. 28. Composition of American Food Materials.
No. 34. Meats, Composition and Cooking.
No. 43. Sewage Disposal on the Farm.
No. 85. Fish as Food.
No. 93. Sugar as Food.
No. 121. Beans, Peas and other Legumes as Food.
No. 128. Eggs and Their Uses as Food.
No. 142. Principles of Nutrition and the Nutritive Value of Food.
No. 166. Cheese Making on the Farm.
No. 175. Home Manufacture and Use of Unfermented Grape Juices.
No. 182. Poultry as a Food.
No. 183. Meats on the Farm, Butchering, Curing and Keeping.
No. 185. Beautifying the Home Grounds.
No. 203. Canned Fruits, Preserves and Jellies.
No. 218. The School Garden.
No. 241. Butter Making on the Farm.
No. 249. Cereal Breakfast Foods.
No. 256. Preparation of Vegetables for the Table.
No. 259. Canning of Vegetables.
No. 262. Water for Table Use.
No. 270. Modern Home Conveniences on Farm.
No. 274. Flax Culture.
No. 293. Use of Fruit as Food.
No. 295. Potatoes and Other Root Crops as Food.
No. 302. Sea Island Cotton.

No. 332. Nuts and Their Uses as Food.
No. 342. A Model Kitchen.
No. 345. Some Common Disinfectants.
No. 359. Canning Vegetables in the Home.
No. 363. The Use of Milk as a Food.
No. 375. Care of Food in the Home.
No. 389. Bread and Bread Making.
No. 391. Economic Use of Meat in the Home.
No. 413. Care of Milk and Its Use in the Home.
No. 426. Canning of Peaches on the Farm.
No. 459. House Flies.
No. 478. How to Prevent Typhoid Fever.
No. 487. Cheese and Its Economic Uses in the Diet.
No. 521. Canning Tomatoes at Home and in Club Work.
No. 526. Muttom and Its Value in the Diet.
No. 541. Butter Making on the Farm.
No. 565. Corn Meal as a Food and Ways of Using It.
No. 601. New Methods of Cotton Culture.

(2) Helpful College and University Bulletins

The following bulletins may be obtained from the "Extension Department", Ohio State University, Columbus, Ohio.

Home Makers' Reading Course

The Care of Milk.
Home Butter Making.
The Kitchen.
Cereals.
Fruit and Vegetable Canning.
Jellies, Jams, Preserves and Pickles.
Bread and Bread Making.
Sanitation.
Sewing.
Meat and Meat Substitutes.

The following bulletins may be secured from Extension Department, Iowa State College, Ames, Iowa.

Planning and Serving Meals.
Bacteria and Ice Cream, No. 134.
Healthful Homes.
Planning and Decorating the Home Ground.
Testing Dairy Cans.

The following bulletins may be secured from Illinois State University, Urbana, Ill.

Principles of Jelly Making.
Relative Economy, Composition and Nutritive Value of the Various Cuts of Beef, No. 158.
Some Points on Choosing Textiles.
Syllabus of Domestic Science and Art. Price 25c.
The Judging of Bread.

The following bulletins may be secured from the Extension Department, Purdue University, Lafayette, Ind.

Some Points in Bread Making.
Industrial Clubs and Contests.
The School Lunch Box.
Domestic Science in the High School.
Domestic Science in Rural Communities.
Elementary Sewing.
Some Principles of Canning.

The following bulletins may be secured by teachers or librarians from Cornell University, Ithaca, N. Y.

The Cornell Reading Course

The Laundry.
Rules for Planning the Family Dietary.
Choice and Care of Utensils.
The Care and Feeding of Children, Parts 1 and 2.
The Box Luncheon.
Rice and Its Cookery.
Human Nutrition, Parts 1 and 2.
A Story of Certain Table Furnishings.
A Canning Business for the Farm Home.
Cost of Food.
Reading in the Farm Home.
Practical Housekeeping.
Saving Strength.
Insect Pests of House and Garden.
Household Decoration.
Household Furnishing.
Saving Steps.
The Farm House.
Household Insects and Methods of Controlling Them.
Hints for Choosing Textiles.
Household Bacteriology.

Special Bulletins

Principles of Candy Making. University of Missouri, Columbia, Mo.

Labor Saving Devices for the Farm Home. Utah State College, Logan, Utah.

Hints on Clothing. Teachers College, Columbia University, New York, N. Y. 10c.

The Feeding of Young Children. Teachers College, Columbia, University, New York, N. Y. 10c.

For complete list for reference on Home-making subjects see B. R. Andrews' "Education for the Home", Part IV. U. S. Bureau of Education. Bulletin, 1914, No. 39, Washington, D. C.

5. OTHER VALUABLE LIBRARY HELPS

Helpful charts and diagrams may be secured from manufacturers, Paint companies, Wall and Decorating companies, showing interior of homes, color schemes for decoration, the manufacture of cloth and other articles used in the home. These materials, if collected should be carefully preserved for observation and demonstration purposes.

A valuable device for teachers to have is a bulletin board for clippings pertaining to the home and home work, brought in by pupils and teachers for the benefit of the entire class.

The following magazines give helpful suggestions and information on certain aspects of the home-making work:

GENERAL

Journal of Home Economics. *Five Issues.* Roland Park Branch, Baltimore, Md. $2.00.

Good Housekeeping Magazine. *Monthly.* Phelps Pub. Co., 381 Fourth Ave., New York. $1.50.

COOKING

Boston Cooking School Magazine. *Monthly* (except July and August). 372 Boylston St., Boston. $1.00.

National Food Magazine. *Monthly.* 45 W. 34th St., New York. $1.00.

Table Talk. *Monthly.* Arthur H. Christ Co., Cooperstown, N. Y. $1.00.

DRESSMAKING

American Modiste. *Quarterly.* 453 W. Van Buren St., Chicago. $1.50.

Bon Ton. *Monthly.* Royal Pattern Co., 174 Fifth Ave., New York. $3.50.

Criterion of Fashion. *Monthly.* 615 W. 43d St., New York. 50c.

Delineator. *Monthly.* Butterick Pub. Co., New York. $1.50.

Designer. *Monthly.* Standard Fashion Co., 12 Vandam St., New York. 50c.

Elite. *Monthly.* Elite Styles Co., 54 W. 23d St., New York. $1.50.

L'Art de la Mode. *Monthly.* Morse Broughton Co., 8-14 W. 39th St., New York. $3.50.

Ladies' Home Journal. *Monthly.* Curtis Publishing Co., Independence Sq., Philadelphia. $1.50.

Le Costume Royal. *Monthly.* 285 Fifth Ave., New York. $3.50.

Modern Priscilla. *Monthly.* Priscilla Pub. Co., 120 Boylston St., Boston. 50c.

Vogue. *Semimonthly.* 443 Fourth Ave., New York. $4.00.

MILLINERY

Illustrated Milliner. *Monthly.* 656 Broadway, New York. $4.00.

The Milliner. *Monthly.* 215 S. Market St., Chicago. $2.00.

Milliner Trade Review. *Monthly.* 13 Astor Pl., New York. $2.00.

EMBROIDERY

Home Needlework Magazine. *Bimonthly.* Florence Pub. Co., Florence, Mass. 75c.

TEXTILES

Posselt's Textile Journal. *Monthly.* 2159 N. 21st St., Philadelphia. $2.00.

American Silk Journal. *Monthly.* Clifford & Lawton Pub. Co., 1 E. 28th St., New York. $2.00.

BIBLIOGRAPHIES

For further information concerning equipment and the laying out of Domestic Science laboratories consult:

Kinne, Helen. *Equipment for Teaching Domestic Science.* Whitcomb & Barrows, Boston, 1911. 80c.

Andrews, B. R. *Education for the Home, Part 1, Introductory Survey and Equipment of Household Arts.* U. S. Bureau of Education, Bulletin No. 36 and 37, 1914-15, Washington, D. C.

O'Leary, Mrs. I. P. *Cooking in the Vocational School.* U. S. Bureau of Education, Bulletin 1915, No. 1 Washington, D. C.

LIBRARY OF CONGRESS
0 014 183 579 8